Appendix C: BLM Wind Energy Development Program Policies and BMPs

ATTACHMENT A

BLM WIND ENERGY DEVELOPMENT PROGRAM POLICIES AND BEST MANAGEMENT PRACTICES (BMPS)

ATTACHMENT A

BLM WIND ENERGY DEVELOPMENT PROGRAM POLICIES AND BEST MANAGEMENT PRACTICES (BMPS)

The BLM's Wind Energy Development Program will establish a number of policies and BMPs, provided below, regarding the development of wind energy resources on BLM-administered public lands. The policies and BMPs will be applicable to all wind energy development projects on BLM-administered public lands. The policies address the administration of wind energy development activities, and the BMPs identify required mitigation measures that would need to be incorporated into project-specific Plans of Development (PODs) and right-of-way (ROW) authorization stipulations. Additional mitigation measures will be applied to individual projects, in the form of stipulations in the ROW authorization as appropriate, to address site-specific and species-specific issues.

These policies and BMPs were formulated through preparation of the Final Wind Energy PEIS (BLM 2005). The PEIS included detailed, comprehensive analysis of the potential impacts of wind energy development and relevant mitigation measures; reviews of existing, relevant mitigation guidance; and reviews of comments received during scoping and public review of the Draft PEIS.

A.1 Policies

- The BLM will not issue ROW authorizations for wind energy development on lands on which wind energy development is incompatible with specific resource values. Lands that will be excluded from wind energy site monitoring and testing and development include designated areas that are part of the National Landscape Conservation System (NLCS) (e.g., Wilderness Areas, Wilderness Study Areas, National Monuments, NCAs,[1] Wild and Scenic Rivers, and National Historic and Scenic Trails) and Areas of Critical Environmental Concern (ACECs).[2] Additional areas of land may be excluded from wind energy development on the basis of findings of resource impacts that cannot be mitigated and/or conflict with existing and planned multiple-use activities or land use plans.

- To the extent possible, wind energy projects shall be developed in a manner that will not prevent other land uses, including minerals extraction, livestock grazing, recreational use, and other ROW uses.

---

[1] Wind energy development is permitted in one NCA, the California Desert Conservation Area (CDCA), in accordance with the provisions of the *California Desert Conservation Area Plan 1980, as Amended* (BLM 1999).

[2] Although the MPDS developed for this PEIS (Section 2.2.1 and Appendix B) did not exclude all of these lands at the screening level, they will be excluded from wind energy development.

- Entities seeking to develop a wind energy project on BLM-administered lands shall consult with appropriate federal, state, and local agencies regarding specific projects as early in the planning process as appropriate to ensure that all potential construction, operation, and decommissioning issues and concerns are identified and adequately addressed.

- The BLM will initiate government-to-government consultation with Indian Tribal governments whose interests might be directly and substantially affected by activities on BLM-administered lands as early in the planning process as appropriate to ensure that construction, operation, and decommissioning issues and concerns are identified and adequately addressed.

- Entities seeking to develop a wind energy project on BLM-administered lands, in conjunction with BLM Washington Office (WO) and Field Office (FO) staff, shall consult with the U.S. Department of Defense (DoD) regarding the location of wind power projects and turbine siting as early in the planning process as appropriate. This consultation shall occur concurrently at both the installation/field level and the Pentagon/BLM WO level. An interagency protocol agreement is being developed to establish a consultation process and to identify the scope of issues for consultation. Lands withdrawn for military purposes are under the administrative jurisdiction of the DoD or a military service and are not available for issuance of wind energy authorizations by the BLM.

- The BLM will consult with the U.S. Fish and Wildlife Service (USFWS) as required by Section 7 of the Endangered Species Act of 1973 (ESA). The specific consultation requirements will be determined on a project-by-project basis.

- The BLM will consult with the State Historic Preservation Office (SHPO) as required by Section 106 of the National Historic Preservation Act of 1966 (NHPA). The specific consultation requirements will be determined on a project-by-project basis. If programmatic Section 106 consultations have been conducted and are adequate to cover a proposed project, additional consultation may not be needed.

- Existing land use plans will be amended, as appropriate, to (1) adopt provisions of the BLM's Wind Energy Development Program, (2) identify land considered to be available for wind energy development, and (3) identify land that will not be available for wind energy development.

- The level of environmental analysis to be required under NEPA for individual wind power projects will be determined at the FO level. For many projects, it may be determined that a tiered environmental assessment (EA) is appropriate in lieu of an EIS. To the extent that the PEIS addresses anticipated issues and

concerns associated with an individual project, including potential cumulative impacts, the BLM will tier off of the decisions embedded in the PEIS and limit the scope of additional project-specific NEPA analyses. The site-specific NEPA analyses will include analyses of project site configuration and micrositing considerations, monitoring program requirements, and appropriate mitigation measures. In particular, the mitigation measures discussed in Chapter 5 of the PEIS may be consulted in determining site-specific requirements. Public involvement will be incorporated into all wind energy development projects to ensure that all concerns and issues are identified and adequately addressed. In general, the scope of the NEPA analyses will be limited to the proposed action on BLM-administered public lands; however, if access to proposed development on adjacent non-BLM-administered lands is entirely dependent on obtaining ROW access across BLM-administered public lands and there are no alternatives to that access, the NEPA analysis for the proposed ROW may need to assess the environmental effects from that proposed development. The BLM's analyses of ROW access projects may tier off of the PEIS to the extent that the proposed project falls within the scope of the PEIS analyses.

- Site-specific environmental analyses will tier from the PEIS and identify and assess any cumulative impacts that are beyond the scope of the cumulative impacts addressed in the PEIS.

- The Categorical Exclusion (CX) applicable to the issuance of short-term ROWs or land use authorizations may be applicable to some site monitoring and testing activities. The relevant CX, established for the BLM in the DOI Departmental Manual 516, Chapter 11, Sec. 11.5, E(19) (DOI 2004), encompasses "issuance of short-term (3 years or less) rights-of-way or land use authorizations for such uses as storage sites, apiary sites, and construction sites where the proposal includes rehabilitation to restore the land to its natural or original condition."

- The BLM will require financial bonds for all wind energy development projects on BLM-administered public lands to ensure compliance with the terms and conditions of the rights-of-way authorization and the requirements of applicable regulatory requirements, including reclamation costs. The amount of the required bond will be determined during the rights-of-way authorization process on the basis of site-specific and project-specific factors. The BLM may also require financial bonds for site monitoring and testing authorizations.

- Entities seeking to develop a wind energy project on BLM-administered public lands shall develop a project-specific Plan of Development (POD) that incorporates all BMPs and, as appropriate, the requirements of other existing and relevant BLM mitigation guidance, including the BLM's interim off-site mitigation guidance (BLM 2005a). Additional mitigation measures will be

incorporated into the POD and into the ROW authorization as project stipulations, as needed, to address site-specific and species-specific issues. The POD will include a site plan showing the locations of turbines, roads, power lines, other infrastructure, and other areas of short- and long-term disturbance.

- The BLM will incorporate management goals and objectives specific to habitat conservation for species of concern (e.g., sage-grouse), as appropriate, into the POD for proposed wind energy projects.

- The BLM will consider the visual resource values of the public lands involved in proposed wind energy development projects, consistent with BLM Visual Resource Management (VRM) policies and guidance. The BLM will work with the ROW applicant to incorporate visual design considerations into the planning and design of the project to minimize potential visual impacts of the proposal and to meet the VRM objectives of the area.

- Operators of wind power facilities on BLM-administered public lands shall consult with the BLM and other appropriate federal, state, and local agencies regarding any planned upgrades or changes to the wind facility design or operation. Proposed changes of this nature may require additional environmental analysis and/or revision of the POD.

- The BLM's Wind Energy Development Program will incorporate adaptive management strategies to ensure that potential adverse impacts of wind energy development are avoided (if possible), minimized, or mitigated to acceptable levels. The programmatic policies and BMPs will be updated and revised as new data regarding the impacts of wind power projects become available. At the project-level, operators will be required to develop monitoring programs to evaluate the environmental conditions at the site through all phases of development, to establish metrics against which monitoring observations can be measured, to identify potential mitigation measures, and to establish protocols for incorporating monitoring observations and additional mitigation measures into standard operating procedures and project-specific stipulations.

A.2 Best Management Practices (BMPs)

The BMPs will be adopted as required elements of project-specific PODs and/or as ROW authorization stipulations. They are categorized by development activity: site monitoring and testing, development of the POD, construction, operation, and decommissioning. The BMPs for development of the POD identify required elements of the POD needed to address potential impacts associated with subsequent phases of development.

A.2.1 Site Monitoring and Testing

- The area disturbed by installation of meteorological towers (i.e., footprint) shall be kept to a minimum.

- Existing roads shall be used to the maximum extent feasible. If new roads are necessary, they shall be designed and constructed to the appropriate standard.

- Meteorological towers shall not be located in sensitive habitats or in areas where ecological resources known to be sensitive to human activities (e.g., prairie grouse) are present. Installation of towers shall be scheduled to avoid disruption of wildlife reproductive activities or other important behaviors.

- Meteorological towers installed for site monitoring and testing shall be inspected periodically for structural integrity.

A.2.2 Plan of Development Preparation

General

- The BLM and operators shall contact appropriate agencies, property owners, and other stakeholders early in the planning process to identify potentially sensitive land uses and issues, rules that govern wind energy development locally, and land use concerns specific to the region.

- Available information describing the environmental and sociocultural conditions in the vicinity of the proposed project shall be collected and reviewed as needed to predict potential impacts of the project.

- The Federal Aviation Administration (FAA)-required notice of proposed construction shall be made as early as possible to identify any air safety measures that would be required.

- To plan for efficient use of the land, necessary infrastructure requirements shall be consolidated wherever possible, and current transmission and market access shall be evaluated carefully.

- The project shall be planned to utilize existing roads and utility corridors to the maximum extent feasible, and to minimize the number and length/size of new roads, lay-down areas, and borrow areas.

- A monitoring program shall be developed to ensure that environmental conditions are monitored during the construction, operation, and

decommissioning phases. The monitoring program requirements, including adaptive management strategies, shall be established at the project level to ensure that potential adverse impacts of wind energy development are mitigated. The monitoring program shall identify the monitoring requirements for each environmental resource present at the site, establish metrics against which monitoring observations can be measured, identify potential mitigation measures, and establish protocols for incorporating monitoring observations and additional mitigation measures into standard operating procedures and BMPs.

- "Good housekeeping" procedures shall be developed to ensure that during operation the site will be kept clean of debris, garbage, fugitive trash or waste, and graffiti; to prohibit scrap heaps and dumps; and to minimize storage yards.

Wildlife and Other Ecological Resources

- Operators shall review existing information on species and habitats in the vicinity of the project area to identify potential concerns.

- Operators shall conduct surveys for federal and/or state-protected species and other species of concern (including special status plant and animal species) within the project area and design the project to avoid (if possible), minimize, or mitigate impacts to these resources.

- Operators shall identify important, sensitive, or unique habitats in the vicinity of the project and design the project to avoid (if possible), minimize, or mitigate impacts to these habitats (e.g., locate the turbines, roads, and ancillary facilities in the least environmentally sensitive areas; i.e., away from riparian habitats, streams, wetlands, drainages, or critical wildlife habitats).

- The BLM will prohibit the disturbance of any population of federal listed plant species.

- Operators shall evaluate avian and bat use of the project area and design the project to minimize or mitigate the potential for bird and bat strikes (e.g., development shall not occur in riparian habitats and wetlands). Scientifically rigorous avian and bat use surveys shall be conducted; the amount and extent of ecological baseline data required shall be determined on a project basis.

- Turbines shall be configured to avoid landscape features known to attract raptors, if site studies show that placing turbines there would pose a significant risk to raptors.

- Operators shall determine the presence of bat colonies and avoid placing turbines near known bat hibernation, breeding, and maternity/nursery colonies; in known migration corridors; or in known flight paths between colonies and feeding areas.

- Operators shall determine the presence of active raptor nests (i.e., raptor nests used during the breeding season). Measures to reduce raptor use at a project site (e.g., minimize road cuts, maintain either no vegetation or nonattractive plant species around the turbines) shall be considered.

- A habitat restoration plan shall be developed to avoid (if possible), minimize, or mitigate negative impacts on vulnerable wildlife while maintaining or enhancing habitat values for other species. The plan shall identify revegetation, soil stabilization, and erosion reduction measures that shall be implemented to ensure that all temporary use areas are restored. The plan shall require that restoration occur as soon as possible after completion of activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.

- Procedures shall be developed to mitigate potential impacts to special status species. Such measures could include avoidance, relocation of project facilities or lay-down areas, and/or relocation of biota.

- Facilities shall be designed to discourage their use as perching or nesting substrates by birds. For example, power lines and poles shall be configured to minimize raptor electrocutions and discourage raptor and raven nesting and perching.

Visual Resources

- The public shall be involved and informed about the visual site design elements of the proposed wind energy facilities. Possible approaches include conducting public forums for disseminating information, offering organized tours of operating wind developments, and using computer simulation and visualization techniques in public presentations.

- Turbine arrays and turbine design shall be integrated with the surrounding landscape. Design elements to be addressed include visual uniformity, use of tubular towers, proportion and color of turbines, nonreflective paints, and prohibition of commercial messages on turbines.

- Other site design elements shall be integrated with the surrounding landscape. Elements to address include minimizing the profile of the ancillary structures, burial of cables, prohibition of commercial symbols, and lighting. Regarding

lighting, efforts shall be made to minimize the need for and amount of lighting on ancillary structures.

Roads

- An access road siting and management plan shall be prepared incorporating existing BLM standards regarding road design, construction, and maintenance such as those described in the BLM 9113 Manual (BLM 1985) and the *Surface Operating Standards for Oil and Gas Exploration and Development* (RMRCC 1989) (i.e., the Gold Book).

Ground Transportation

- A transportation plan shall be developed, particularly for the transport of turbine components, main assembly cranes, and other large pieces of equipment. The plan shall consider specific object sizes, weights, origin, destination, and unique handling requirements and shall evaluate alternative transportation approaches. In addition, the process to be used to comply with unique state requirements and to obtain all necessary permits shall be clearly identified.

- A traffic management plan shall be prepared for the site access roads to ensure that no hazards would result from the increased truck traffic and that traffic flow would not be adversely impacted. This plan shall incorporate measures such as informational signs, flaggers when equipment may result in blocked throughways, and traffic cones to identify any necessary changes in temporary lane configuration.

Noise

- Proponents of a wind energy development project shall take measurements to assess the existing background noise levels at a given site and compare them with the anticipated noise levels associated with the proposed project.

Noxious Weeds and Pesticides

- Operators shall develop a plan for control of noxious weeds and invasive species, which could occur as a result of new surface disturbance activities at the site. The plan shall address monitoring, education of personnel on weed identification, the manner in which weeds spread, and methods for treating infestations. The use of certified weed-free mulching shall be required. If trucks and construction equipment are arriving from locations with known

invasive vegetation problems, a controlled inspection and cleaning area shall be established to visually inspect construction equipment arriving at the project area and to remove and collect seeds that may be adhering to tires and other equipment surfaces.

- If pesticides are used on the site, an integrated pest management plan shall be developed to ensure that applications would be conducted within the framework of BLM and DOI policies and entail only the use of EPA-registered pesticides. Pesticide use shall be limited to nonpersistent, immobile pesticides and shall only be applied in accordance with label and application permit directions and stipulations for terrestrial and aquatic applications.

Cultural/Historic Resources

- The BLM will consult with Indian Tribal governments early in the planning process to identify issues regarding the proposed wind energy development, including issues related to the presence of cultural properties, access rights, disruption to traditional cultural practices, and impacts to visual resources important to the Tribe(s).

- The presence of archaeological sites and historic properties in the area of potential effect shall be determined on the basis of a records search of recorded sites and properties in the area and/or, depending on the extent and reliability of existing information, an archaeological survey. Archaeological sites and historic properties present in the area of potential effect shall be reviewed to determine whether they meet the criteria of eligibility for listing on the *National Register of Historic Places* (NRHP).

- When any rights-of-way application includes remnants of a National Historic Trail, is located within the viewshed of a National Historic Trail's designated centerline, or includes or is within the viewshed of a trail eligible for listing on the NRHP, the operator shall evaluate the potential visual impacts to the trail associated with the proposed project and identify appropriate mitigation measures for inclusion as stipulations in the POD.

- If cultural resources are present at the site, or if areas with a high potential to contain cultural material have been identified, a cultural resources management plan (CRMP) shall be developed. This plan shall address mitigation activities to be taken for cultural resources found at the site. Avoidance of the area is always the preferred mitigation option. Other mitigation options include archaeological survey and excavation (as warranted) and monitoring. If an area exhibits a high potential, but no artifacts were observed during an archaeological survey, monitoring by a qualified archaeologist could be required during all excavation and

earthmoving in the high-potential area. A report shall be prepared documenting these activities. The CRMP also shall (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of artifacts and destruction of property on public land.

Paleontological Resources

- Operators shall determine whether paleontological resources exist in a project area on the basis of the sedimentary context of the area, a records search for past paleontological finds in the area, and/or, depending on the extent of existing information, a paleontological survey.

- If paleontological resources are present at the site, or if areas with a high potential to contain paleontological material have been identified, a paleontological resources management plan shall be developed. This plan shall include a mitigation plan for collection of the fossils; mitigation could include avoidance, removal of fossils, or monitoring. If an area exhibits a high potential but no fossils were observed during survey, monitoring by a qualified paleontologist could be required during all excavation and earthmoving in the sensitive area. A report shall be prepared documenting these activities. The paleontological resources management plan also shall (1) establish a monitoring program, (2) identify measures to prevent potential looting/vandalism or erosion impacts, and (3) address the education of workers and the public to make them aware of the consequences of unauthorized collection of fossils on public land.

Hazardous Materials and Waste Management

- Operators shall develop a hazardous materials management plan addressing storage, use, transportation, and disposal of each hazardous material anticipated to be used at the site. The plan shall identify all hazardous materials that would be used, stored, or transported at the site. It shall establish inspection procedures, storage requirements, storage quantity limits, inventory control, nonhazardous product substitutes, and disposition of excess materials. The plan shall also identify requirements for notices to federal and local emergency response authorities and include emergency response plans.

- Operators shall develop a waste management plan identifying the waste streams that are expected to be generated at the site and addressing hazardous waste determination procedures, waste storage locations, waste-specific management and disposal requirements, inspection procedures, and waste

minimization procedures. This plan shall address all solid and liquid wastes that may be generated at the site.

- Operators shall develop a spill prevention and response plan identifying where hazardous materials and wastes are stored on site, spill prevention measures to be implemented, training requirements, appropriate spill response actions for each material or waste, the locations of spill response kits on site, a procedure for ensuring that the spill response kits are adequately stocked at all times, and procedures for making timely notifications to authorities.

Storm Water

- Operators shall develop a storm water management plan for the site to ensure compliance with applicable regulations and prevent off-site migration of contaminated storm water or increased soil erosion.

Human Health and Safety

- A safety assessment shall be conducted to describe potential safety issues and the means that would be taken to mitigate them, including issues such as site access, construction, safe work practices, security, heavy equipment transportation, traffic management, emergency procedures, and fire control.

- A health and safety program shall be developed to protect both workers and the general public during construction, operation, and decommissioning of a wind energy project. Regarding occupational health and safety, the program shall identify all applicable federal and state occupational safety standards; establish safe work practices for each task (e.g., requirements for personal protective equipment and safety harnesses; Occupational Safety and Health Administration [OSHA] standard practices for safe use of explosives and blasting agents; and measures for reducing occupational electric and magnetic fields [EMF] exposures); establish fire safety evacuation procedures; and define safety performance standards (e.g., electrical system standards and lightning protection standards). The program shall include a training program to identify hazard training requirements for workers for each task and establish procedures for providing required training to all workers. Documentation of training and a mechanism for reporting serious accidents to appropriate agencies shall be established.

- Regarding public health and safety, the health and safety program shall establish a safety zone or setback for wind turbine generators from residences and occupied buildings, roads, rights-of-ways, and other public access areas that is sufficient to prevent accidents resulting from the operation of wind turbine generators. It shall identify requirements for temporary fencing

around staging areas, storage yards, and excavations during construction or decommissioning activities. It shall also identify measures to be taken during the operation phase to limit public access to hazardous facilities (e.g., permanent fencing would be installed only around electrical substations, and turbine tower access doors would be locked).

- Operators shall consult with local planning authorities regarding increased traffic during the construction phase, including an assessment of the number of vehicles per day, their size, and type. Specific issues of concern (e.g., location of school bus routes and stops) shall be identified and addressed in the traffic management plan.

- If operation of the wind turbines is expected to cause significant adverse impacts to nearby residences and occupied buildings from shadow flicker, low-frequency sound, or EMF, site-specific recommendations for addressing these concerns shall be incorporated into the project design (e.g., establishing a sufficient setback from turbines).

- The project shall be planned to minimize electromagnetic interference (EMI) (e.g., impacts to radar, microwave, television, and radio transmissions) and comply with Federal Communications Commission [FCC] regulations. Signal strength studies shall be conducted when proposed locations have the potential to impact transmissions. Potential interference with public safety communication systems (e.g., radio traffic related to emergency activities) shall be avoided.

- The project shall be planned to comply with FAA regulations, including lighting regulations, and to avoid potential safety issues associated with proximity to airports, military bases or training areas, or landing strips.

- Operators shall develop a fire management strategy to implement measures to minimize the potential for a human-caused fire.

A.2.3 Construction

General

- All control and mitigation measures established for the project in the POD and the resource-specific management plans that are part of the POD shall be maintained and implemented throughout the construction phase, as appropriate.

- The area disturbed by construction and operation of a wind energy development project (i.e., footprint) shall be kept to a minimum.

- The number and size/length of roads, temporary fences, lay-down areas, and borrow areas shall be minimized.

- Topsoil from all excavations and construction activities shall be salvaged and reapplied during reclamation.

- All areas of disturbed soil shall be reclaimed using weed-free native grasses, forbs, and shrubs. Reclamation activities shall be undertaken as early as possible on disturbed areas.

- All electrical collector lines shall be buried in a manner that minimizes additional surface disturbance (e.g., along roads or other paths of surface disturbance). Overhead lines may be used in cases where burial of lines would result in further habitat disturbance.

- Operators shall identify unstable slopes and local factors that can induce slope instability (such as groundwater conditions, precipitation, earthquake activities, slope angles, and the dip angles of geologic strata). Operators also shall avoid creating excessive slopes during excavation and blasting operations. Special construction techniques shall be used where applicable in areas of steep slopes, erodible soil, and stream channel crossings.

- Erosion controls that comply with county, state, and federal standards shall be applied. Practices such as jute netting, silt fences, and check dams shall be applied near disturbed areas.

Wildlife

- Guy wires on permanent meteorological towers shall be avoided, however, may be necessary on temporary meteorological towers installed during site monitoring and testing.

- In accordance with the habitat restoration plan, restoration shall be undertaken as soon as possible after completion of construction activities to reduce the amount of habitat converted at any one time and to speed up the recovery to natural habitats.

- All construction employees shall be instructed to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. In addition, pets shall not be permitted on site during construction.

Visual Resources

- Operators shall reduce visual impacts during construction by minimizing areas of surface disturbance, controlling erosion, using dust suppression techniques, and restoring exposed soils as closely as possible to their original contour and vegetation.

Roads

- Existing roads shall be used, but only if in safe and environmentally sound locations. If new roads are necessary, they shall be designed and constructed to the appropriate standard and be no higher than necessary to accommodate their intended functions (e.g., traffic volume and weight of vehicles). Excessive grades on roads, road embankments, ditches, and drainages shall be avoided, especially in areas with erodible soils. Special construction techniques shall be used, where applicable. Abandoned roads and roads that are no longer needed shall be recontoured and revegetated.

- Access roads and on-site roads shall be surfaced with aggregate materials, wherever appropriate.

- Access roads shall be located to follow natural contours and minimize side hill cuts.

- Roads shall be located away from drainage bottoms and avoid wetlands, if practicable.

- Roads shall be designed so that changes to surface water runoff are avoided and erosion is not initiated.

- Access roads shall be located to minimize stream crossings. All structures crossing streams shall be located and constructed so that they do not decrease channel stability or increase water velocity. Operators shall obtain all applicable federal and state permits.

- Existing drainage systems shall not be altered, especially in sensitive areas such as erodible soils or steep slopes. Potential soil erosion shall be controlled at culvert outlets with appropriate structures. Catch basins, roadway ditches, and culverts shall be cleaned and maintained regularly.

Ground Transportation

- Project personnel and contractors shall be instructed and required to adhere to speed limits commensurate with road types, traffic volumes, vehicle types,

and site-specific conditions, to ensure safe and efficient traffic flow and to reduce wildlife collisions and disturbance and airborne dust.

- Traffic shall be restricted to the roads developed for the project. Use of other unimproved roads shall be restricted to emergency situations.

- Signs shall be placed along construction roads to identify speed limits, travel restrictions, and other standard traffic control information. To minimize impacts on local commuters, consideration shall be given to limiting construction vehicles traveling on public roadways during the morning and late afternoon commute time.

Air Emissions

- Dust abatement techniques shall be used on unpaved, unvegetated surfaces to minimize airborne dust.

- Speed limits (e.g., 25 mph [40 km/h]) shall be posted and enforced to reduce airborne fugitive dust.

- Construction materials and stockpiled soils shall be covered if they are a source of fugitive dust.

- Dust abatement techniques shall be used before and during surface clearing, excavation, or blasting activities.

Excavation and Blasting Activities

- Operators shall gain a clear understanding of the local hydrogeology. Areas of groundwater discharge and recharge and their potential relationships with surface water bodies shall be identified.

- Operators shall avoid creating hydrologic conduits between two aquifers during foundation excavation and other activities.

- Foundations and trenches shall be backfilled with originally excavated material as much as possible. Excess excavation materials shall be disposed of only in approved areas or, if suitable, stockpiled for use in reclamation activities.

- Borrow material shall be obtained only from authorized and permitted sites. Existing sites shall be used in preference to new sites.

- Explosives shall be used only within specified times and at specified distances from sensitive wildlife or streams and lakes, as established by the BLM or other federal and state agencies.

Noise

- Noisy construction activities (including blasting) shall be limited to the least noise-sensitive times of day (i.e., daytime only between 7 a.m. and 10 p.m.) and weekdays.

- All equipment shall have sound-control devices no less effective than those provided on the original equipment. All construction equipment used shall be adequately muffled and maintained.

- All stationary construction equipment (i.e., compressors and generators) shall be located as far as practicable from nearby residences.

- If blasting or other noisy activities are required during the construction period, nearby residents shall be notified in advance.

Cultural and Paleontological Resources

- Unexpected discovery of cultural or paleontological resources during construction shall be brought to the attention of the responsible BLM authorized officer immediately. Work shall be halted in the vicinity of the find to avoid further disturbance to the resources while they are being evaluated and appropriate mitigation measures are being developed.

Hazardous Materials and Waste Management

- Secondary containment shall be provided for all on-site hazardous materials and waste storage, including fuel. In particular, fuel storage (for construction vehicles and equipment) shall be a temporary activity occurring only for as long as is needed to support construction activities.

- Wastes shall be properly containerized and removed periodically for disposal at appropriate off-site permitted disposal facilities.

- In the event of an accidental release to the environment, the operator shall document the event, including a root cause analysis, appropriate corrective actions taken, and a characterization of the resulting environmental or health and safety impacts. Documentation of the event shall be provided to the BLM authorized officer and other federal and state agencies, as required.

- Any wastewater generated in association with temporary, portable sanitary facilities shall be periodically removed by a licensed hauler and introduced into an existing municipal sewage treatment facility. Temporary, portable sanitary facilities provided for construction crews shall be adequate to support expected on-site personnel and shall be removed at completion of construction activities.

Public Health and Safety

- Temporary fencing shall be installed around staging areas, storage yards, and excavations during construction to limit public access.

A.2.4 Operation

General

- All control and mitigation measures established for the project in the POD and the resource-specific management plans that are part of the POD shall be maintained and implemented throughout the operational phase, as appropriate. These control and mitigation measures shall be reviewed and revised, as needed, to address changing conditions or requirements at the site, throughout the operational phase. This adaptive management approach would help ensure that impacts from operations are kept to a minimum.

- Inoperative turbines shall be repaired, replaced, or removed in a timely manner. Requirements to do so shall be incorporated into the due diligence provisions of the rights-of-way authorization. Operators will be required to demonstrate due diligence in the repair, replacement, or removal of turbines; failure to do so could result in termination of the rights-of-way authorization.

Wildlife

- Employees, contractors, and site visitors shall be instructed to avoid harassment and disturbance of wildlife, especially during reproductive (e.g., courtship and nesting) seasons. In addition, any pets shall be controlled to avoid harassment and disturbance of wildlife.

- Observations of potential wildlife problems, including wildlife mortality, shall be reported to the BLM authorized officer immediately.

Ground Transportation

- Ongoing ground transportation planning shall be conducted to evaluate road use, minimize traffic volume, and ensure that roads are maintained adequately to minimize associated impacts.

Monitoring Program

- Site monitoring protocols defined in the POD shall be implemented. These will incorporate monitoring program observations and additional mitigation measures into standard operating procedures and BMPs to minimize future environmental impacts.

- Results of monitoring program efforts shall be provided to the BLM authorized officer.

Public Health and Safety

- Permanent fencing shall be installed and maintained around electrical substations, and turbine tower access doors shall be locked to limit public access.

- In the event an installed wind energy development project results in EMI, the operator shall work with the owner of the impacted communications system to resolve the problem. Additional warning information may also need to be conveyed to aircraft with onboard radar systems so that echoes from wind turbines can be quickly recognized.

A.2.5 Decommissioning

General

- Prior to the termination of the rights-of-way authorization, a decommissioning plan shall be developed and approved by the BLM. The decommissioning plan shall include a site reclamation plan and monitoring program.

- All management plans, BMPs, and stipulations developed for the construction phase shall be applied to similar activities during the decommissioning phase.

- All turbines and ancillary structures shall be removed from the site.

- Topsoil from all decommissioning activities shall be salvaged and reapplied during final reclamation.

- All areas of disturbed soil shall be reclaimed using weed-free native shrubs, grasses, and forbs.

- The vegetation cover, composition, and diversity shall be restored to values commensurate with the ecological setting.

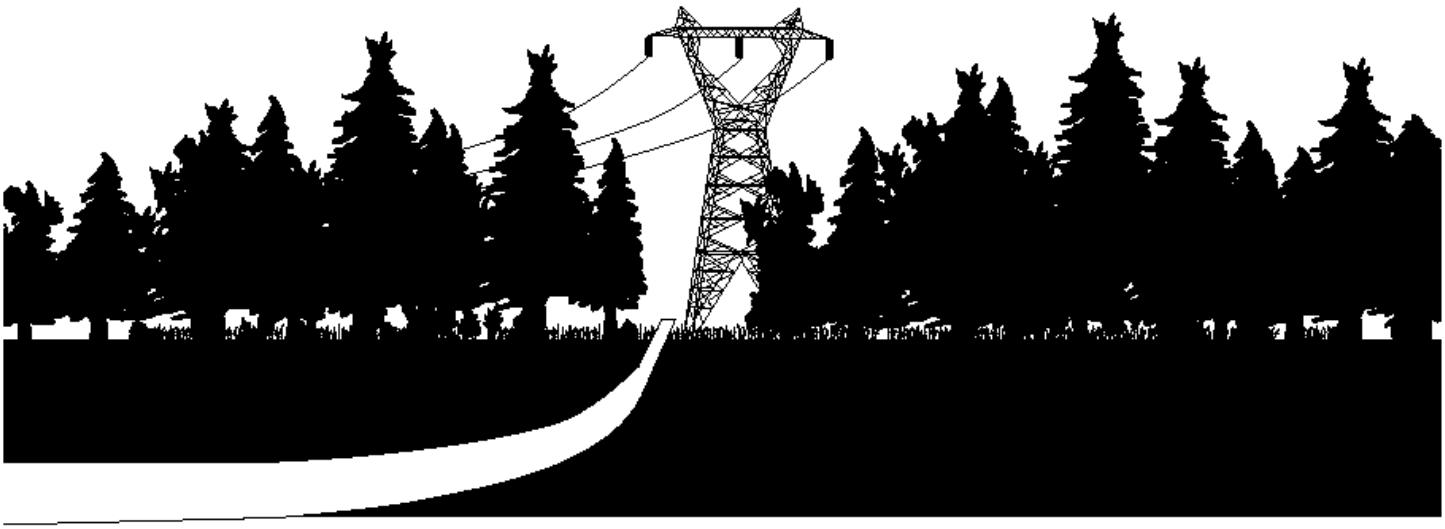
Appendix D: Western Area Power Administration Construction Standards

Western
AREA POWER
ADMINISTRATION

CONSTRUCTION STANDARDS

STANDARD 13

ENVIRONMENTAL QUALITY PROTECTION



July 2009

SAFETY
A HABIT TO LIVE BY

Form 8400-4

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date	June 2, 2009
District	Las Vegas Field Office
Resource Area	
Activity (program)	Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name
Searchlight Wind Project

2. Key Observation Point
KOP 1 – Railroad Pass Hotel/Casino

3. VRM Class
NA

4. Location

Township 23S
Range 63E
Section 2

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently rolling to flat valleys with angular and jagged mountainous features	Pixilated and amorphous/patchy	Vertical, horizontal, angular, cylindrical, and geometric
LINE	Strong horizon line with jagged terrain and various silhouettes	Simple and irregular	Straight, horizontal, angular, geometric, and vertical
COLOR	Various grays, tans, browns, and reds with a slight bluish hue due to hazy atmospheric conditions in the distance	Forest, true, and olive greens with various hues	White, tan, metallic, reds, yellows, and browns
TEX-TURE	Rough to smooth	Medium, scattered, and clumped	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently rolling valley with anular, jagged mountains	Pixilated and amorphous/patchy	Vertical and oscillating (revolving/gyrating)
LINE	Strong jagged horizo0n and silhouette lines	Simple and irregular	Vertical and angular
COLOR	Various tans, grays, and browns	Forest, true, and olive greens with various hues	White
TEX-TURE	Smooth	Medium, scattered, and clumped	Smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				X				X			X	
	Line				X				X				X
	Color				X				X			X	
	Texture			X					X				X

2. Does project design meet visual resource management objectives?
☒ Yes ☐ No
(Explain on reverse side)

3. Additional mitigating measures recommended?
☐ Yes ☒ No
(Explain on reverse side)

Evaluator's Names Date

Robert Evans June 2, 2009

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date	June 3, 2009
District	Las Vegas Field Office
Resource Area	
Activity (program)	Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name
Searchlight Wind Project

2. Key Observation Point
KOP2 – U.S. 95 looking south toward Searchlight, NV

3. VRM Class
NA

4. Location

Township _____
Range _____
Section _____

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Broad rolling alluvial valley with rugged background terrain	Moderately uniform with patches of taller more dominant vegetation	Vertical and horizontal
LINE	Undulating with a strong horizon line	Undulating with edge created by man-made structures (road)	Vertical with divergent bands/lines
COLOR	Browns, tans, and grays	Various hues of green with some tan and brown	Metallic and various grays
TEX-TURE	Medium to smooth	Medium to smooth	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Possible geometric patterns and simple indistinct forms created by cut and fill	Possible geometric shapes and simple indistinct forms created by clearings for roads and structure pads (construction activities)	Vertical, angular, and oscillating circular elements (revolving/gyrating)
LINE	Undulating with edges and lines created by possible visible cut and fill	Lines and edges created by clearing vegetation for construction activities	Vertical, angular, and circular oscillating blades/line features
COLOR	Tans and browns	Various light to dark greens	White
TEX-TURE	Smooth	Patchy	Smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			X			X					X	
	Line		X				X					X	
	Color			X				X			X		
	Texture				X		X						X

2. Does project design meet visual resource management objectives?
☒ Yes ☐ No
(Explain on reverse side)

3. Additional mitigating measures recommended?
☒ Yes ☐ No
(Explain on reverse side)

Evaluator's Names Date

Robert Evans June 3, 2009

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date	June 2, 2009
District	Kingman Field Office
Resource Area	
Activity (program)	Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name
Searchlight Wind Project

2. Key Observation Point
KOP 3 – U.S. 93 past Hoover Dam

3. VRM Class
NA

4. Location

Township 28N
Range 22W
Section 1

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Pyramidal and angular, rugged mountains and flat plateaus with sweeping sides often exhibiting dendritic patterns. Dominant mesa in foreground creates strong silhouette.	Pixilated, sparse and dotted	
LINE	Angular and hard with jagged terrain and silhouettes. Dominant silhouette (mesa) in foreground.	Simple and undulating	
COLOR	Various grays, tans, browns, and a blue or deep aqua color for the water	True and olive greens which are indistinct in the background	
TEX-TURE	Rough with numerous silhouettes	Dotted, medium	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Sweeping smooth water feature with pyramidal and angular, rugged mountains and flat plateaus with sweeping sides often exhibiting dendritic patterns	Pixilated, sparse and dotted	Vertical, angular, and oscillating (revolving/gyrating)
LINE	Angular and hard with jagged terrain and silhouettes	Simple and undulating	Vertical and angular
COLOR	Various tans, grays, and browns	Forest, true, and olive greens with various hues	White
TEX-TURE	Rough with numerous silhouettes	Medium, dotted	Smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				X				X			X	
	Line				X				X			X	
	Color			X					X			X	
	Texture				X				X			X	

2. Does project design meet visual resource management objectives?
☒ Yes ☐ No
(Explain on reverse side)

3. Additional mitigating measures recommended?
☐ Yes ☒ No
(Explain on reverse side)

Evaluator's Names Date

Robert Evans June 2, 2009

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date	June 2, 2009
District	Kingman Field Office
Resource Area	
Activity (program)	Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name
Searchlight Wind Project

2. Key Observation Point
KOP 4 – Windy Point Campground

3. VRM Class
NA-to be provided

4. Location

Township 24N
Range 18W
Section 25

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Jagged with pyramidal and angular, rugged mountains in the foreground and background bisected by relatively flat valley floors (textbook basin and range)	Patchy and pixilated with simple forms created by vegetation along slopes in the foreground to middleground	Angular and geometric in the middleground
LINE	Angular with sharp silhouettes created by the peaks and mountain ranges	Simple forms and digitate edges created by the vegetation on the slopes in the middleground and foreground	Curvilinear features (roads) and edges created by angular structures
COLOR	Various grays, tans, browns, and red hues	Various greens (dark to light tones)-foreest, true, olive as well as orange and yellow (flowers)	Metallic, white, and tan
TEX-TURE	Rough in foreground/middleground to amorphous and smooth in the background	Rough in the immediate foreground, with medium in foreground and smooth in middleground/background	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Jagged silhouettes created by distant mountains	Simple, smooth patterns (random)	Vertical, angular, and oscillating (revolving/gyrating)
LINE	Horizon and silhouette lines in the middle to background	Simple and indistinct patterns	Vertical and angular
COLOR	Various tans, grays, red hues, and browns (with a bluish hue in the background)	Various light to dark greens	White
TEX-TURE	Rough to smooth	Rough to smooth	Smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				X				X				X
	Line				X				X			X	
	Color			X					X			X	
	Texture				X				X				X

2. Does project design meet visual resource management objectives?
☒ Yes ☐ No
(Explain on reverse side)

3. Additional mitigating measures recommended?
☒ Yes ☐ No
(Explain on reverse side)

Evaluator's Names Date

Robert Evans June 2, 2009

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date	June 2, 2009
District	Las Vegas Field Office
Resource Area	
Activity (program)	Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name: **Searchlight Wind Project**
2. Key Observation Point: **KOP 5 – Palm Community**
3. VRM Class: **NA**
4. Location: Township 31S; Range 64E; Section 32
5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Flat to rolling foreground valley views with dramatic and rugged terrain in the background	Uniform and undulating	Vertical and geometric
LINE	Undulating to rugged silhouettes in the background	Butt edges created between uniform vegetation and the dramatic background terrain	Vertical, angular, and geometric
COLOR	Grays, tans, browns, and a bluish hue created by atmospheric conditions	Monochromatic tans and olive greens	Metallic
TEX-TURE	Medium to smooth in the foreground and middleground to course in the background	Course to smooth in the foreground and middleground to fine in the background	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Possible geometric shapes created by cut and fill for roads	Possible geometric shapes created by clearings for roads and structure pads	Vertical, angular, and oscillating (revolving/gyrating)
LINE	Edges created by possible visible cut and fill for roads	Possible edges created by clearing vegetation for structure pads	Vertical and angular
COLOR	Various tans and browns	Various light to dark olive greens	White
TEX-TURE	Smooth	Patchy to smooth	Smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form			X				X				X	
	Line			X					X				X
	Color			X					X		X		
	Texture			X				X					X

2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)

3. Additional mitigating measures recommended? ☒ Yes ☐ No (Explain on reverse side)

Evaluator's Names Date

Robert Evans June 2, 2009

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date	June 3, 2009
District	Kingman Field Office
Resource Area	
Activity (program)	Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name: **Searchlight Wind Project**
2. Key Observation Point: **KOP6 – View from Lake Mojave**
3. VRM Class: **NA – NPS**
4. Location: Township 24N; Range 22W; Section 29
5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rough to smooth water feature in the foreground with pyramidal angular land features on the shoreline and rugged mountain silhouettes in the background	Patchy and sparse	
LINE	Angular with a butt edge created where water feature and land meet as well as a strong horizon line	Simple and undulating with vegetation edges along the water where vegetation is more dense	
COLOR	Various grays, tans, browns, with a reddish hue and a blue bluish hue to the distant mountains with a blue or light aqua color for the water	Dark green	
TEX-TURE	Rough to smooth	Dotted, medium to smooth	

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rough to smooth water feature in the foreground with pyramidal angular land features on the shoreline and rugged mountain silhouettes in the background	Patchy and sparse	Vertical, angular, and oscillating (revolving/gyrating)
LINE	Angular with a butt edge created where water feature and land meet as well as a strong horizon line (possibly interrupted by revolving wind towers)	Simple and undulating with vegetation edges along the water where vegetation is more dense	Vertical and angular with oscillating or revolving circles
COLOR	Various grays, tans, browns, with a reddish hue and a blue bluish hue to the distant mountains with a blue or light aqua color for the water	Dark green	White
TEX-TURE	Rough to smooth	Medium to smooth, dotted	Smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST

	FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side)
	LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	3. Additional mitigating measures recommended? ☐ Yes ☒ No (Explain on reverse side)
ELEMENTS Form				X				X		X			Evaluator's Names Date
Line				X				X		X			Robert Evans June 3, 2009
Color				X				X		X			
Texture				X				X			X		

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date	June 6, 2009
District	Las Vegas Field Office
Resource Area	
Activity (program)	Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name
Searchlight Wind Project
2. Key Observation Point
KOP 7 – Searchlight Nugget Casino
3. VRM Class
NA

4. Location
Township _____
Range _____
Section 2

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently rolling with some prominent elevated features	Patchy with both vertical and broad bushy elements	Vertical, horizontal, angular, cylindrical, and geometric
LINE	Horizontal with edges created by man-made structures, some undulating elements in the background	Simple and irregular/vertical	Straight, horizontal, angular, divergent bands, geometric, and vertical
COLOR	Various grays, tans, browns, and red hues	Forest, true, and various olive greens with various hues	White, tan, metallic, reds, yellows, and browns
TEX-TURE	Medium to smooth	Rough, scattered, and clumped	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently rolling with some prominent elevated features	Patchy with both vertical and broad bushy elements	Vertical and oscillating (revolving/gyrating)
LINE	Horizontal with edges created by man-made structures, some undulating elements in the background	Simple and irregular	Vertical and angular
COLOR	Various tans, grays, and browns	Forest, true, and olive greens with various hues	White
TEX-TURE	Medium to smooth	Rough, scattered, and clumped	Smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				X				X			X	
	Line				X				X				X
	Color				X				X			X	
	Texture			X					X				X

2. Does project design meet visual resource management objectives?
☒ Yes ☐ No
(Explain on reverse side)

3. Additional mitigating measures recommended?
☐ Yes ☒ No
(Explain on reverse side)

Evaluator's Names Date

Robert Evans June 2, 2009

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date	June 2, 2009
District	Las Vegas Field Office
Resource Area	
Activity (program)	Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name
Searchlight Wind Project

2. Key Observation Point
KOP 8 – Development in Searchlight

3. VRM Class
NA

4. Location

Township 28S
Range 65E
Section 35

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Jagged with pyramidal and angular, rugged mountains and silhouettes in the middleground and background rolling in the foreground	Patchy and sparse	Angular, vertical, and horizontal
LINE	Angular and undulating with sharp silhouettes created by the peaks and mountain ranges	Patchy, simple forms	Divergent bands (roads) and horizontal
COLOR	Various grays, tans, browns, and red hues	Light hued greens	Metallic, various grays, green, red brick, brown (wood), and tan
TEX-TURE	Rough in foreground/middleground to amorphous and smooth in the background	Patchy (due to a lack of)	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Jagged with pyramidal and angular, rugged mountains and silhouettes in the middleground and background rolling in the foreground	Patchy and sparse	Vertical, angular, and oscillating (revolving/gyrating)
LINE	Angular and undulating with sharp silhouettes created by the peaks and mountain ranges	Patchy, simple forms	Vertical and angular
COLOR	Various grays, tans, browns, and red hues	Light hued greens	White
TEX-TURE	Rough in foreground/middleground to amorphous and smooth in the background	Patchy (due to a lack of)	Smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
ELEMENTS	Form				X				X		X		
	Line				X				X			X	
	Color			X					X		X		
	Texture				X				X				X

2. Does project design meet visual resource management objectives?
☒ Yes ☐ No
(Explain on reverse side)

3. Additional mitigating measures recommended?
☒ Yes ☐ No
(Explain on reverse side)

Evaluator's Names Date

Robert Evans June 2, 2009

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date	June 3, 2009
District	Southern Nevada
Resource Area	Las Vegas Field Office
Activity (program)	Visual Resources

SECTION A. PROJECT INFORMATION

1. Project Name **Searchlight Wind Project**	4. Location Township 24N Range 22W Section 29	5. Location Sketch See KOP Map
2. Key Observation Point **KOP 9 – View from Cottonwood Cove**		
3. VRM Class **NPS (No VRM)**		

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Water – flat, continuous – land – bold, prominent, rolling hills, sloping, flowing from hills to water	Low, pixilated, patchy	Horizontal, boxy, geometric
LINE	Undulating, butt edge between water and land	Digitate edges on hill crests	Vertical, horizontal, sweeping divergent bands
COLOR	Water – green, aqua Tans, browns, reddish hue	Dark green with olive	White, blue, red, metallic, brown, tan
TEX-TURE	Medium to smooth	Sparse, some stipple with dense patches close to development	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Indiscernible change	Indiscernible change	Vertical, angular, and oscillating (revolving/gyrating)
LINE	Indiscernible change	Indiscernible change	Vertical, angular, and circular line features
COLOR	Indiscernible change	Indiscernible change	White (or gray)
TEX-TURE	Indiscernible change	Indiscernible change	Smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES												2. Does project design meet visual resource management objectives? ☒ Yes ☐ No (Explain on reverse side) 3. Additional mitigating measures recommended? ☐ Yes ☒ No (Explain on reverse side)
		LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)				
		Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	
ELEMENTS	Form				X				X			X		Evaluator's Names Date Richard Stuhan June 3, 2009
	Line				X				X			X		
	Color				X				X				X	
	Texture				X				X				X	

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 8-31-11

District/ Field Office: Las Vegas Field Office

Resource Area:

Activity (program): Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name	4. Location	5. Location Sketch
Searchlight Wind Energy Project	Township_____	
2. Key Observation Point KOP 10 - View of Travelers Exiting the Lake Mead NRA and Lake Mohave on Cottonwood Cove Road	Range_____	
3. VRM Class	Section_____	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Broad rolling alluvial valley with rugged background terrain	Moderately uniform with patches of taller more dominant vegetation	Horizontal (road) Vertical/boxy (entrance station)
LINE	Undulating with a strong horizontal line	Undulating with edge created by manmade structures (road)	Horizontal and vertical
COLOR	Browns, tans and grays	Various hues of green with some tan and brown	Metallic and various grays
TEX-TURE	Medium to smooth	Medium to smooth	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Possible geometric patterns and simple indistinct forms created by cut and fill	Possible geometric shapes and simple indistinct forms created by clearings for roads and structure pads (construction activities)	Vertical, angular, and circular oscillating blades/line features
LINE	Undulating with edges and lines created by possible visible cut and fill	Lines and edges created by clearing vegetation for construction activities	Vertical, angular, and circular oscillating blades/line features
COLOR	Tans and browns	Various light to dark greens	White
TEX-TURE	Smooth	Patchy	Smooth

SECTION D. CONTRAST RATING __SHORT TERM __LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM			X			X					X	
	LINE		X				X					X	
	COLOR			X				X			X		
	TEXTURE				X		X					X	

2. Does project design meet visual resource management objectives?
☒Yes ___No
(Explain on reverses side)

3. Additional mitigating measures recommended
☒Yes ___No (Explain on reverses side)

Evaluator's Names — Date
Anne DuBarton — 8-31-11

Form 8400-4

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 8-31-11

District/ Field Office: Las Vegas Field Office

Resource Area:

Activity (program): Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name	4. Location	5. Location Sketch
Searchlight Wind Energy Project	Township_____	
2. Key Observation Point KOP 11 – Comm Towers Near Spirit Mountain	Range_____	
3. VRM Class	Section_____	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Jagged with pyramidal and angular, rugged mountains in the foreground and background bisected by a relatively flat valley floor	Patchy and pixilated with simple forms created by vegetation along slopes in the foreground to middleground	Angular and geometric in the foreground and middleground
LINE	Angular with sharp silhouettes created by the peaks and mountain ranges	Simple forms and digitate edges created by vegetation on the slopes in the foreground and middleground	Curvilinear to linear features (roads) and edges created by angular structures
COLOR	Various grays, tans, browns, and red hues	Various greens (dark to light tones)- forest, true, olive as well as orange and yellow (flowers)	Metallic, white and tan
TEX-TURE	Rough in foreground/middleground to amorphous and smooth in background	Rough to medium in the immediate foreground, and smooth in middleground/background	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Jagged silhouettes created by distant mountains	Simple, smooth patterns (random)	Vertical, angular, and oscillating (revolving/gyrating)
LINE	Horizon and silhouette lines in the middle to background	Simple and indistinct patterns	Vertical and angular
COLOR	Various tans, grays, red hues, and browns (with a bluish hue in the background)	Various light to dark greens	White
TEX-TURE	Rough to smooth	Rough to smooth	Smooth

SECTION D. CONTRAST RATING __SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM				X				X				X
	LINE				X				X			X	
	COLOR			X					X			X	
	TEXTURE				X				X				X

2. Does project design meet visual resource management objectives?
☒Yes ___No
(Explain on reverses side)

3. Additional mitigating measures recommended
☒Yes ___No (Explain on reverses side)

Evaluator's Names — Date
Anne DuBarton — 8-31-11

Form 8400-4

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 9-1-11

District/ Field Office: Las Vegas Field Office

Resource Area:

Activity (program): Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name	4. Location	5. Location Sketch
Searchlight Wind Energy Project	Township_____	
2. Key Observation Point KOP 13 – Outside Searchlight Historic Hospital	Range_____	
3. VRM Class	Section_____	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently rolling with some prominent elevated features	Patchy with both vertical and broad bushy elements.	Vertical, horizontal, angular, cylindrical, and geometric
LINE	Horizontal with edges created by man-made structures	Undulating with edge created by manmade structures (road/ buildings)	Straight, horizontal, angular, divergent bands, geometric, and vertical
COLOR	Various grays, tans, browns and red hues	Various hues of green with some tan and brown	Metallic and various paint colors on buildings
TEX-TURE	Medium to smooth	Rough, scattered and clumped	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Gently rolling with some prominent elevated features	Patchy with both vertical and broad bushy elements	Vertical, angular, and circular oscillating blades/line features
LINE	Horizontal with edges created by man-made structures	Simple and irregular	Vertical, angular, and circular oscillating blades/line features
COLOR	Tans, grays and browns	Various light to dark greens	White
TEX-TURE	Medium to Smooth	Rough, scattered, and clumped	Smooth

SECTION D. CONTRAST RATING __SHORT TERM __LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1) STRONG	MODERATE	WEAK	NONE	VEGETATION (2) STRONG	MODERATE	WEAK	NONE	STRUCTURES (3) STRONG	MODERATE	WEAK	NONE
FORM				X				X			X	
LINE				X				X				X
COLOR				X							X	
TEXTURE			X					X				X

2. Does project design meet visual resource management objectives?
☒Yes ___No
(Explain on reverses side)

3. Additional mitigating measures recommended
___ Yes ___No (Explain on reverses side)

Evaluator's Names — Date
Anne DuBarton — 8-31-11

Form 8400-4

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 8-31-11

District/ Field Office: Las Vegas Field Office

Resource Area:

Activity (program): Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name Searchlight Wind Energy Project	4. Location Township_____	5. Location Sketch
2. Key Observation Point KOP 14 - View from Cottonwood Cave Looking West	Range_____	
3. VRM Class	Section_____	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Broad rolling alluvial valley with rugged background terrain	Moderately uniform with patches of taller more dominant vegetation	Horizontal (road) Vertical (flagpole/lightpoles)
LINE	Undulating with a strong horizontal line	Undulating with edge created by manmade structures (road/poles)	Horizontal and vertical
COLOR	Browns, tans and grays	Various hues of green with some tan and brown	Metallic and various grays
TEX-TURE	Medium to smooth	Medium to smooth	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Possible geometric patterns and simple indistinct forms created by cut and fill	Possible geometric shapes and simple indistinct forms created by clearings for roads and structure pads (construction activities)	Vertical, angular, and circular oscillating blades/line features
LINE	Undulating with edges and lines created by possible visible cut and fill	Lines and edges created by clearing vegetation for construction activities	Vertical, angular, and circular oscillating blades/line features
COLOR	Tans and browns	Various light to dark greens	White
TEX-TURE	Smooth	Patchy	Smooth

SECTION D. CONTRAST RATING __SHORT TERM __LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1) STRONG	MODERATE	WEAK	NONE	VEGETATION (2) STRONG	MODERATE	WEAK	NONE	STRUCTURES (3) STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM			X			X					X	
	LINE		X				X					X	
	COLOR			X				X			X		
	TEXTURE				X		X					X	

2. Does project design meet visual resource management objectives?
☒Yes ___No
(Explain on reverses side)

3. Additional mitigating measures recommended
☒Yes ___No (Explain on reverses side)

Evaluator's Names — Date
Anne DuBarton — 8-31-11

SECTION D. (Continued)

Form 8400-4

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 9-1-11

District/ Field Office: Las Vegas Field Office

Resource Area:

Activity (program): Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name	4. Location	5. Location Sketch
Searchlight Wind Energy Project	Township_____	
2. Key Observation Point KOP 15 - View from Cottonwood Cave Looking South	Range_____	
3. VRM Class	Section_____	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Broad rolling alluvial valley with rugged background terrain	Moderately uniform with patches of taller more dominant vegetation	Horizontal (road) Vertical (power lines)
LINE	Undulating with a strong horizontal line	Undulating with edge created by manmade structures (road/poles)	Horizontal and vertical
COLOR	Browns, tans and grays	Various hues of green with some tan and brown	Metallic, brown, and various grays
TEX-TURE	Medium to smooth	Medium to smooth	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Possible geometric patterns and simple indistinct forms created by cut and fill	Possible geometric shapes and simple indistinct forms created by clearings for roads and structure pads (construction activities)	Vertical, angular, and circular oscillating blades/line features
LINE	Undulating with edges and lines created by possible visible cut and fill	Lines and edges created by clearing vegetation for construction activities	Vertical, angular, and circular oscillating blades/line features
COLOR	Tans and browns	Various light to dark greens	White
TEX-TURE	Smooth	Patchy	Smooth

SECTION D. CONTRAST RATING __SHORT TERM __LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
		STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE	STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM			X			X				x		
	LINE		X				X				X		
	COLOR			X				X			X		
	TEXTURE				X		X				x		

2. Does project design meet visual resource management objectives?
☒Yes ___No
(Explain on reverses side)

3. Additional mitigating measures recommended
☒Yes ___No (Explain on reverses side)

Evaluator's Names — Date
Anne DuBarton — 9-31-11

Form 8400-4

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT
VISUAL CONTRAST RATING WORKSHEET

Date: 9-1-11

District/ Field Office: Las Vegas Field Office

Resource Area:

Activity (program): Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name	4. Location	5. Location Sketch
Searchlight Wind Energy Project	Township_____	
2. Key Observation Point KOP 16 - View from Cottonwood Cave Looking North	Range_____	
3. VRM Class	Section_____	

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Rolling hills in foreground with rugged background terrain	Moderately uniform with patches of taller more dominant vegetation	None
LINE	Undulating with a strong horizontal line	Undulating with edge created by manmade structures (road/poles)	None
COLOR	Browns, tans and grays	Various hues of green with some tan and brown	None
TEX-TURE	Medium to smooth	Medium to smooth	None

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Possible geometric patterns and simple indistinct forms created by cut and fill	Possible geometric shapes and simple indistinct forms created by clearings for roads and structure pads (construction activities)	Vertical, angular, and circular oscillating blades/line features
LINE	Undulating with edges and lines created by possible visible cut and fill	Lines and edges created by clearing vegetation for construction activities	Vertical, angular, and circular oscillating blades/line features
COLOR	Tans and browns	Various light to dark greens	White
TEX-TURE	Smooth	Patchy	Smooth

SECTION D. CONTRAST RATING __SHORT TERM __LONG TERM

1. DEGREE OF CONTRAST		FEATURES: LAND/WATER BODY (1) STRONG	MODERATE	WEAK	NONE	VEGETATION (2) STRONG	MODERATE	WEAK	NONE	STRUCTURES (3) STRONG	MODERATE	WEAK	NONE
ELEMENTS	FORM			X			X					X	
	LINE		X				X					X	
	COLOR			X				X			X		
	TEXTURE				X		X					X	

2. Does project design meet visual resource management objectives?
☒Yes ___No
(Explain on reverses side)

3. Additional mitigating measures recommended
☒Yes ___No (Explain on reverses side)

Evaluator's Names — Date
Anne DuBarton — 9-31-11

Form 8400-04
(September 1985)

UNITED STATES
DEPARTMENT OF THE INTERIOR
BUREAU OF LAND MANAGEMENT

VISUAL CONTRAST RATING WORKSHEET

Date	June 3, 2009
District	Las Vegas Field Office
Resource Area	
Activity (program)	Proposed Wind Generation

SECTION A. PROJECT INFORMATION

1. Project Name
Searchlight Wind Project

2. Key Observation Point
VP 2 – Cottonwood Cove

3. VRM Class
VRM III

4. Location

Township _____
Range _____
Section _____

5. Location Sketch

SECTION B. CHARACTERISTIC LANDSCAPE DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Developed in the foreground with rolling to rugged in middleground and background with pyramidal shapes and silhouettes in background	Sparse and pixilated	Vertical, horizontal, angular, and geometric
LINE	Rolling hills with distinct peaks created a bold horizon line and silhouette lines in the background	Digitate edges on hill crests, undulating	Vertical, horizontal, curvilinear, and converging
COLOR	Browns and tans with a reddish hue and darker blue hues in the background crated by atmospheric conditions	Light and dark green hues with some tan	Metallic, browns, and tans
TEX-TURE	Medium to smooth and course in the foreground	Medium to smooth	Smooth

SECTION C. PROPOSED ACTIVITY DESCRIPTION

	1. LAND/WATER	2. VEGETATION	3. STRUCTURES
FORM	Possible geometric patterns created by cut and fill	Possible geometric shapes created by clearings for roads and structure pads (construction activities)	Vertical, angular, and oscillating (revolving/gyrating)
LINE	Edges and lines created by possible visible cut and fill	Possible lines and edges created by clearing vegetation for construction activities	Vertical, angular, and circular line features
COLOR	Tans and browns	Light to dark greens	White (or gray)
TEX-TURE	Patchy and smooth	Patchy	Smooth

SECTION D. CONTRAST RATING ☐ SHORT TERM ☒ LONG TERM

1. DEGREE OF CONTRAST

ELEMENTS	FEATURES: LAND/WATER BODY (1)				VEGETATION (2)				STRUCTURES (3)			
	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None	Strong	Moderate	Weak	None
Form			X				X				X	
Line		X						X		X		
Color			X					X		X		
Texture			X				X				X	

2. Does project design meet visual resource management objectives?
☐ Yes ☒ No
(Explain on reverse side)

3. Additional mitigating measures recommended?
☒ Yes ☐ No
(Explain on reverse side)

Evaluator's Names Date

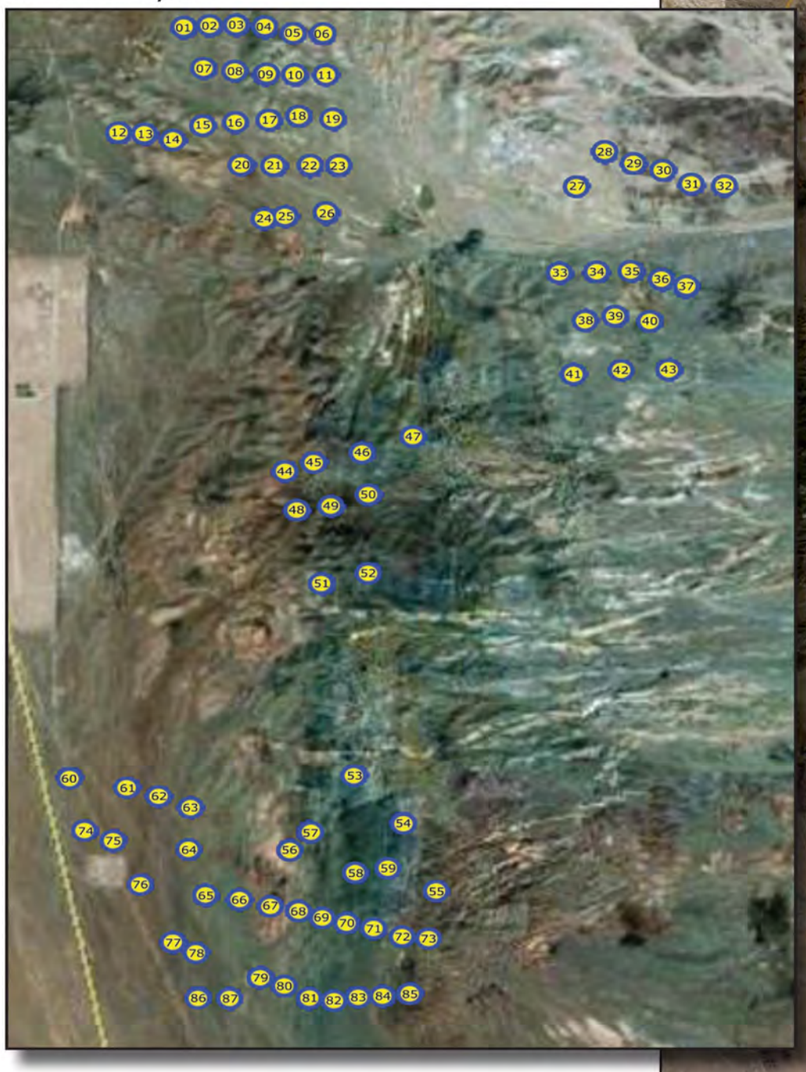
Robert Evans June 3, 2009

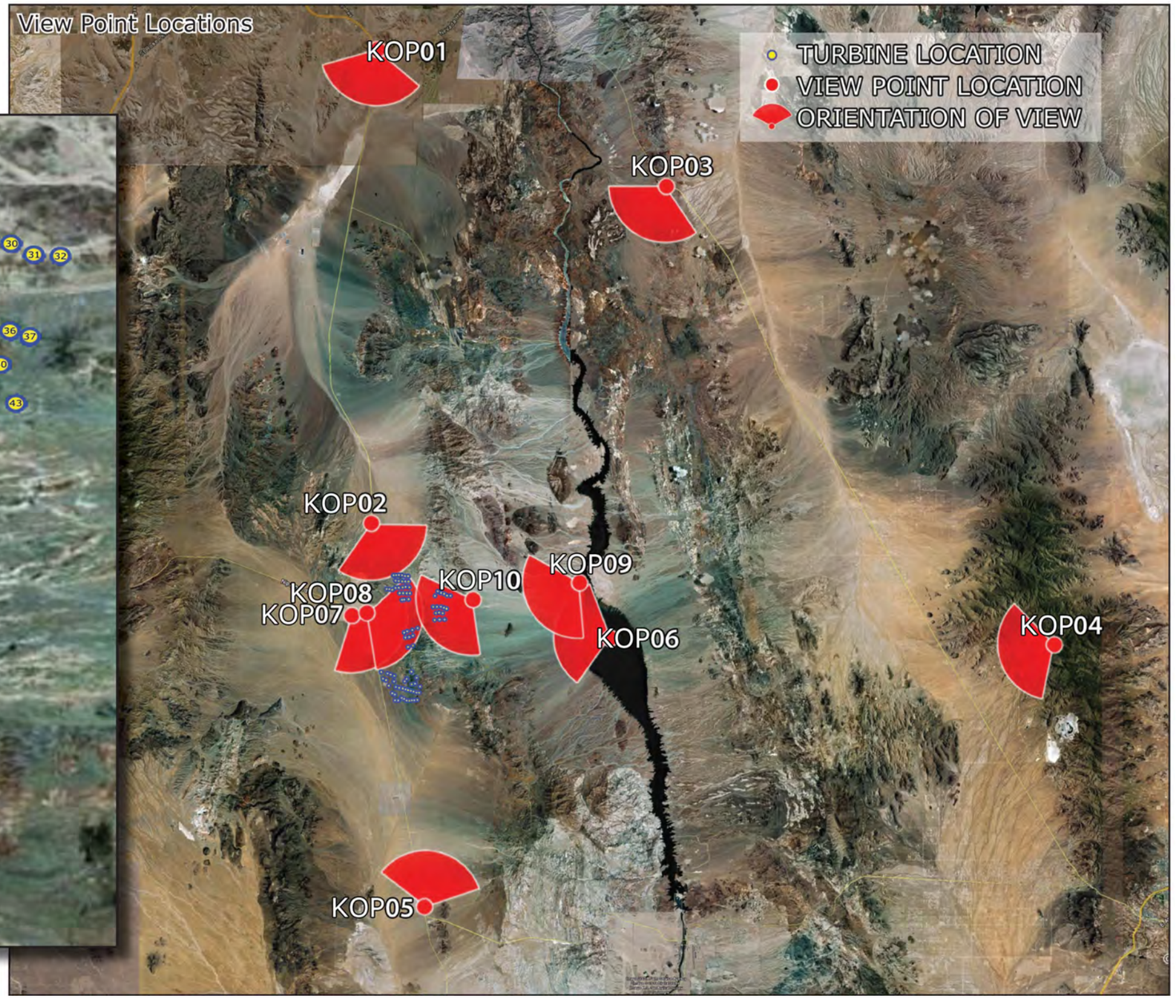
Duke Energy Searchlight

www.truescape.com

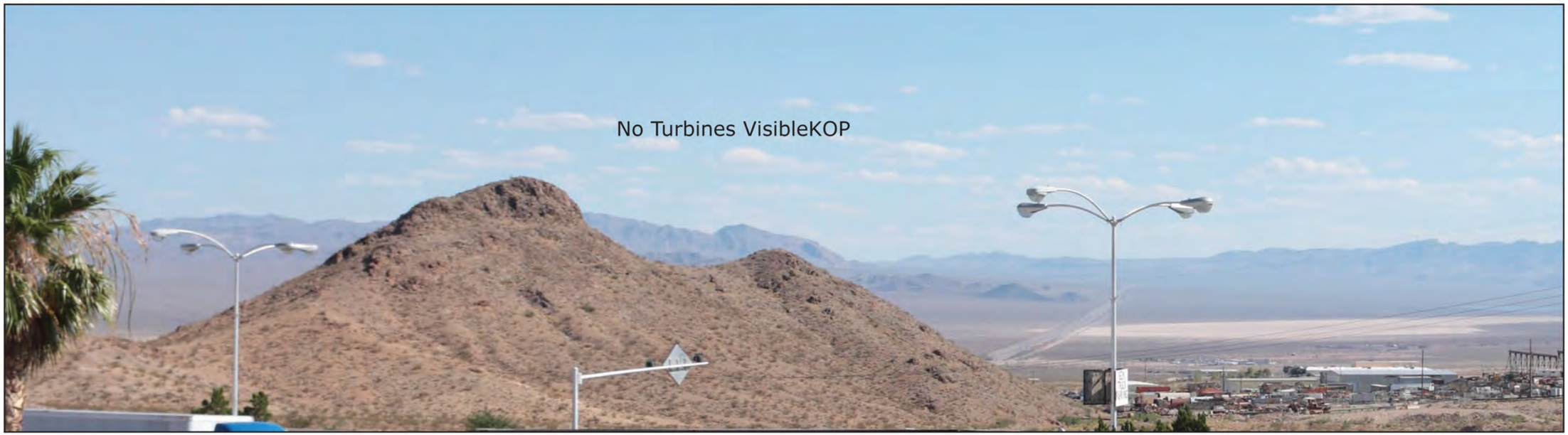
Viewpoint Locations

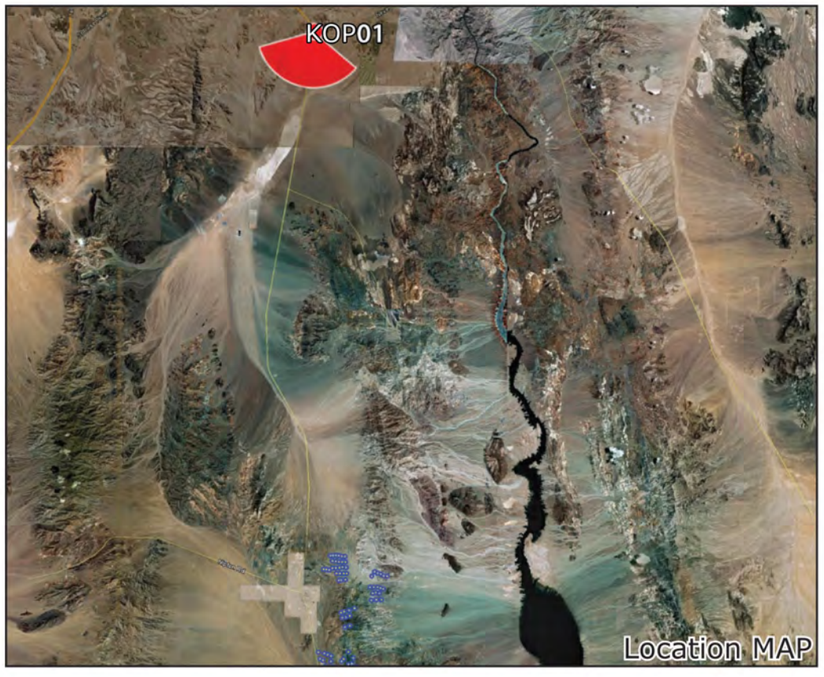
Turbine Layout





KOP01 - View from Railroad Pass hotel/casino

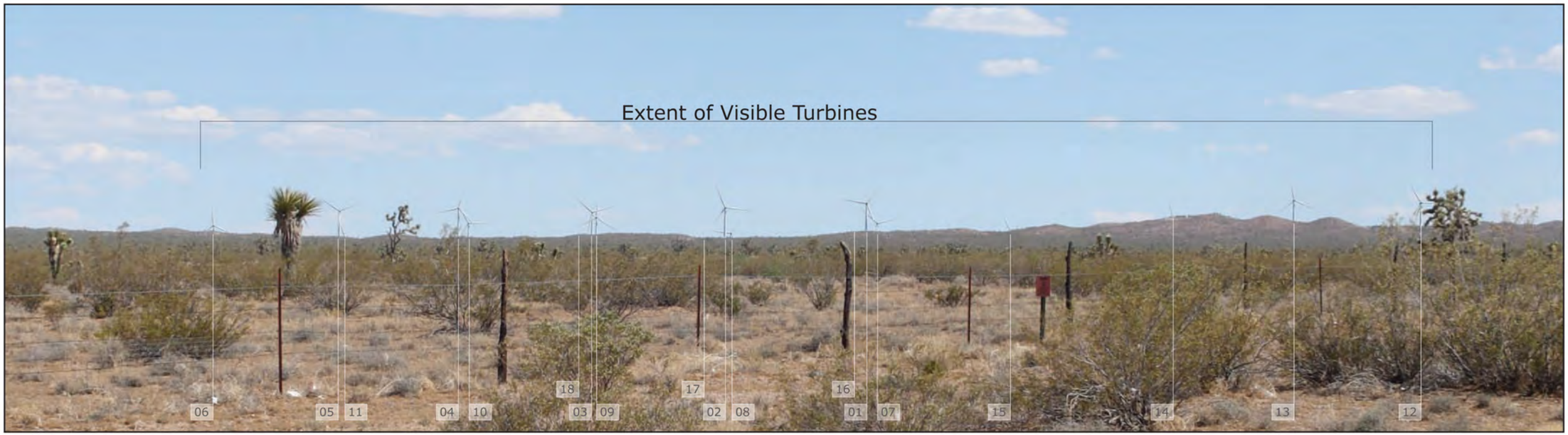


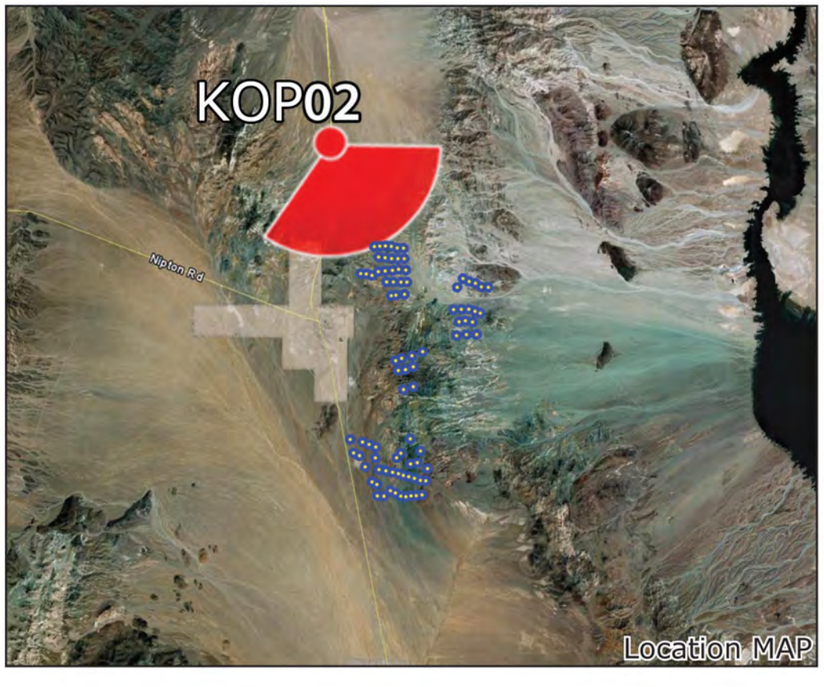


Extent of full TrueView™ simulation

DISTANCE TO NEAREST VISIBLE TURBINE None

KOP02 - View to the south from US 95 north of project area

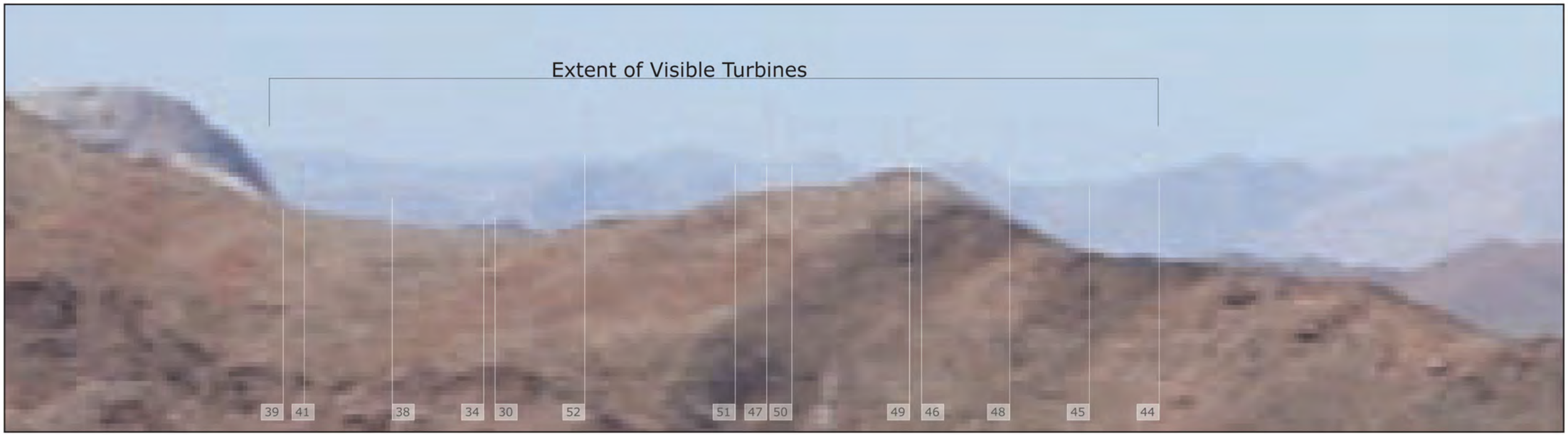


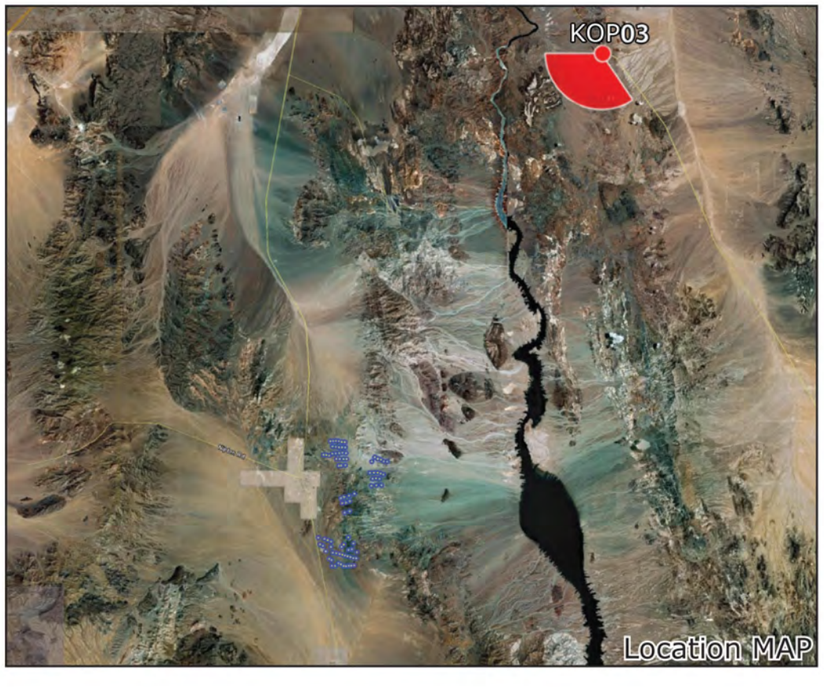


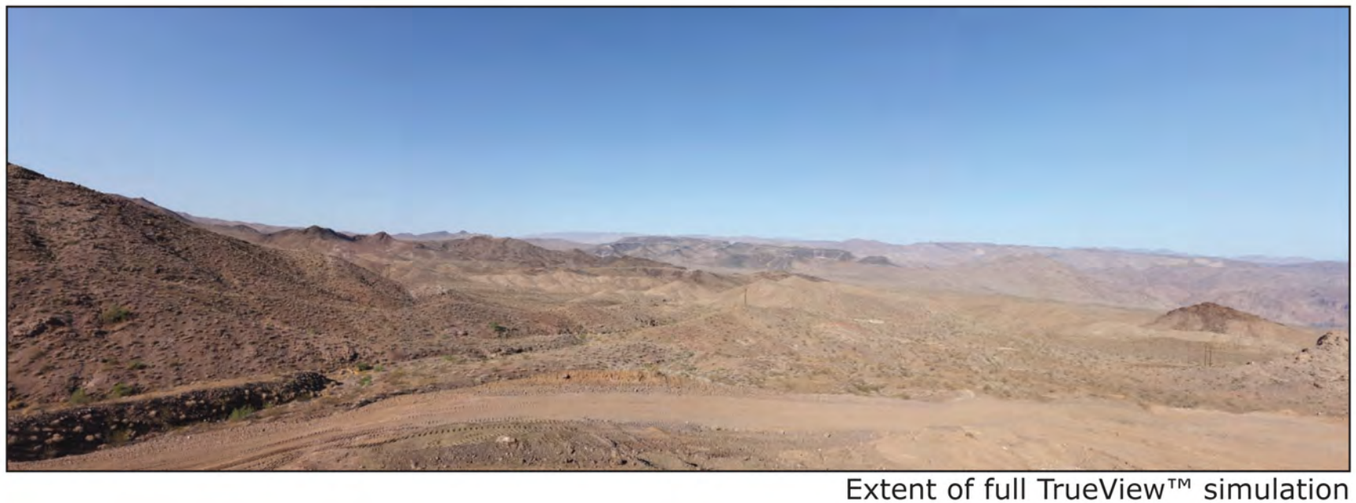
Extent of full TrueView™ simulation

DISTANCE TO NEAREST VISIBLE TURBINE 3.5mi

KOP03 - View from US 93 looking SW



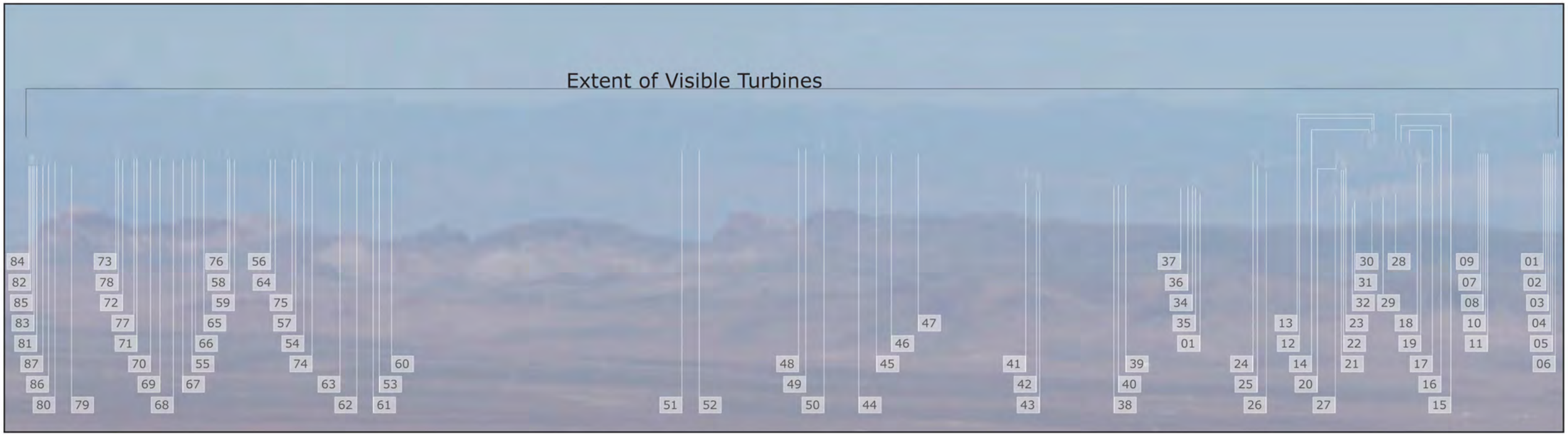


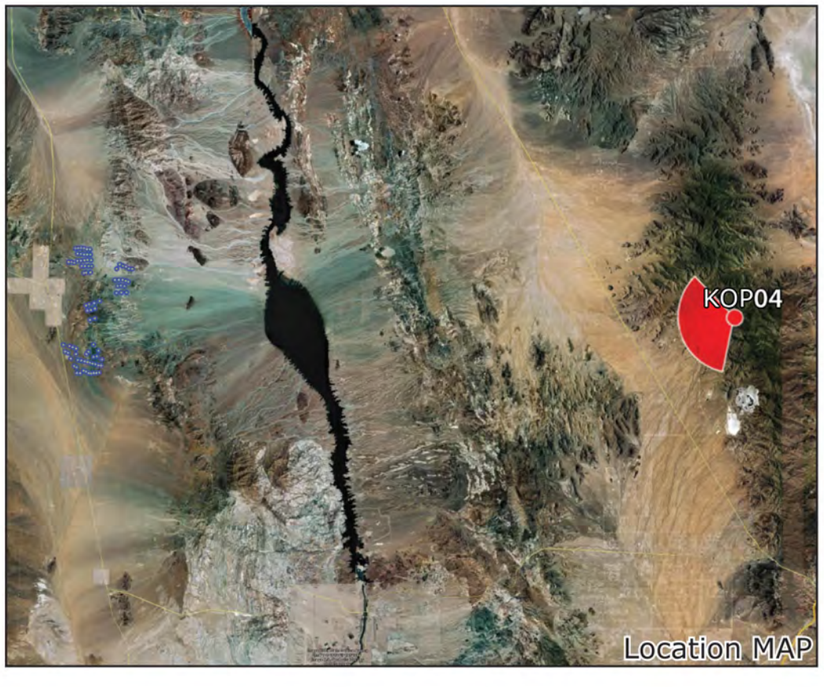


Extent of full TrueView™ simulation

DISTANCE TO NEAREST VISIBLE TURBINE 29.6mi

KOP04 - Windy Point Camping Area

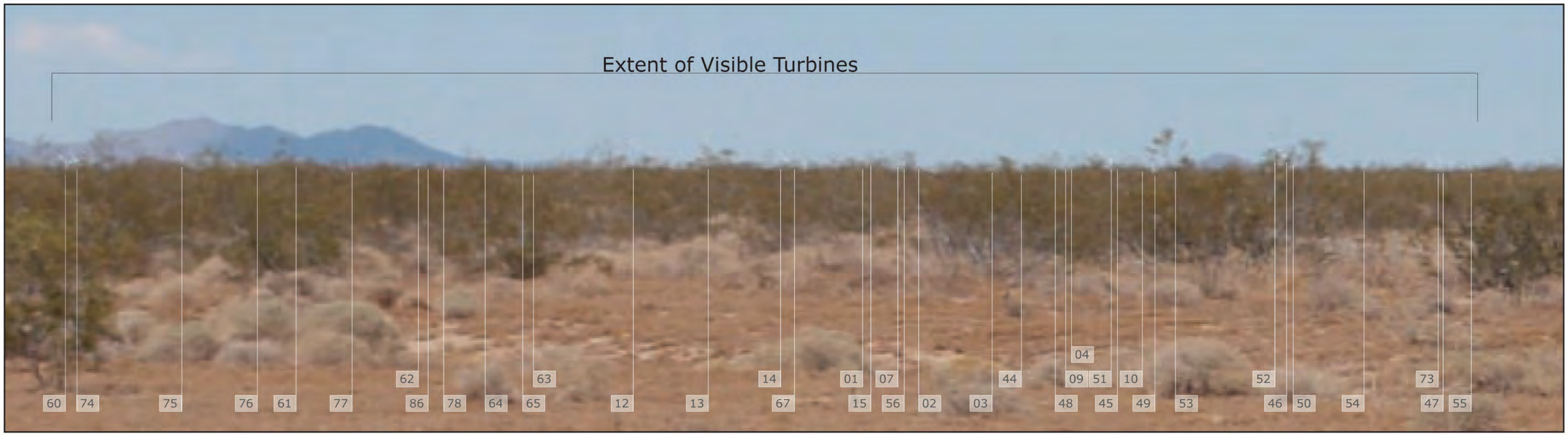


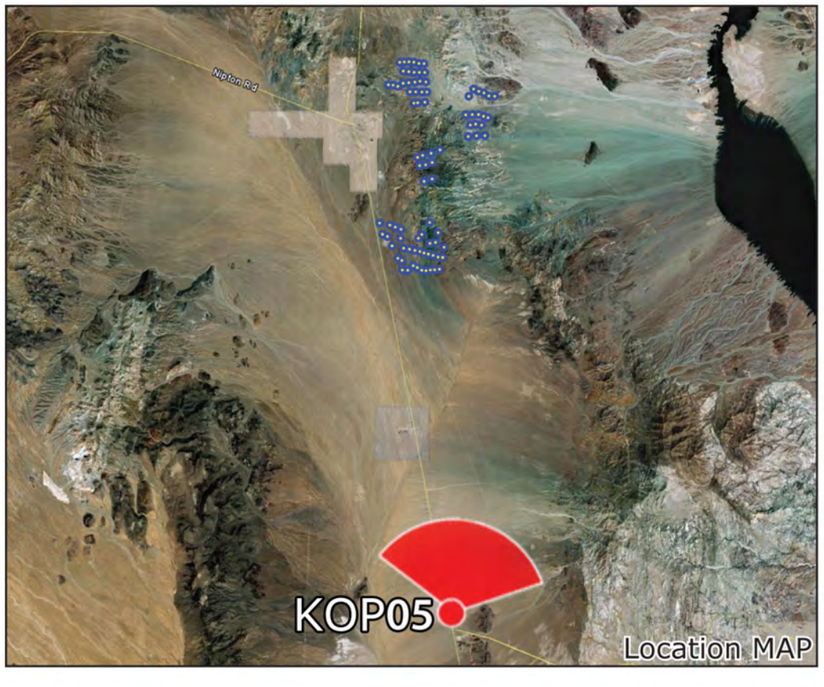


Extent of full TrueView™ simulation

DISTANCE TO NEAREST VISIBLE TURBINE 37.7mi

KOP05 - View from Palm Gardens, NV State Route 163/95

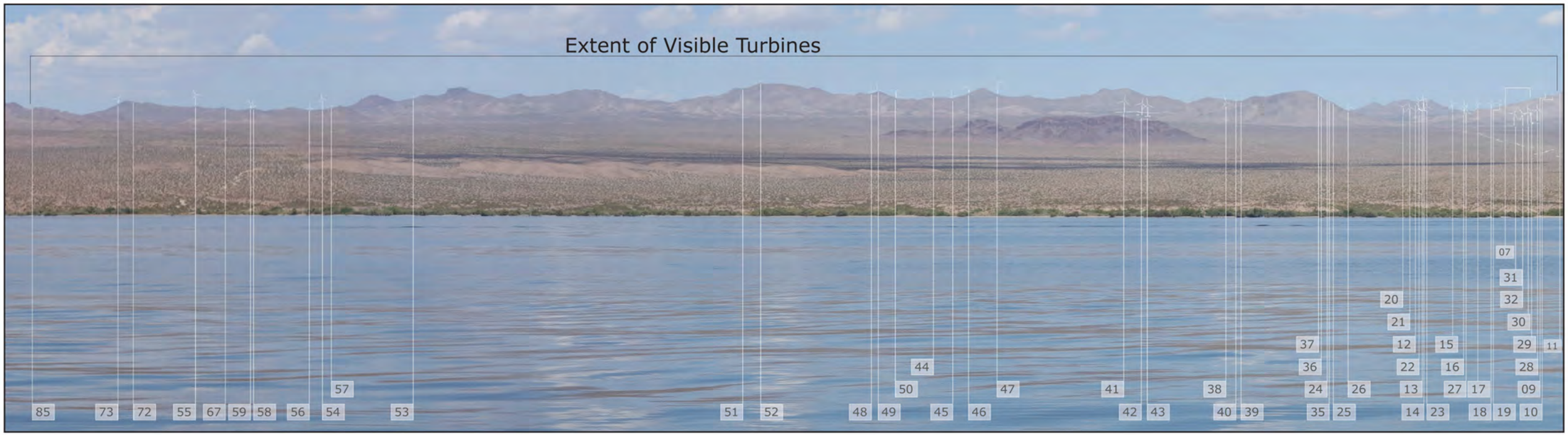


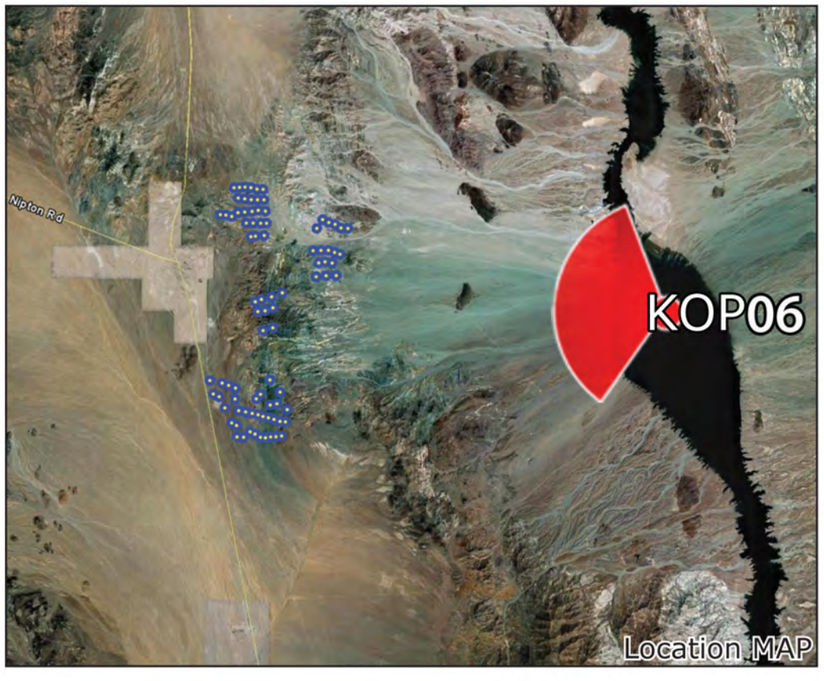


Extent of full TrueView™ simulation

DISTANCE TO NEAREST VISIBLE TURBINE 13.3mi

KOP06 - On Lake Mohave, view to the west at point where lake widens

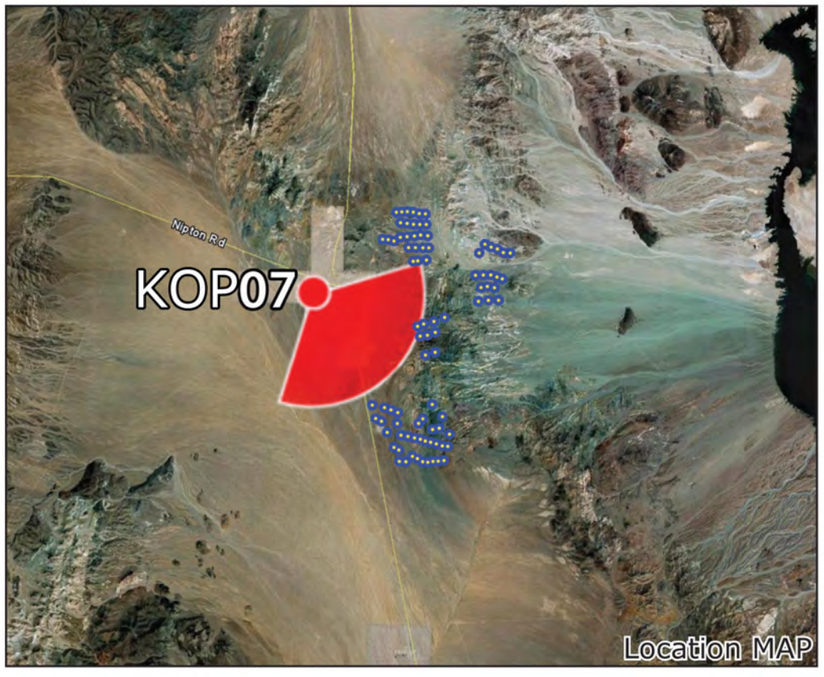




Extent of full TrueView™ simulation

DISTANCE TO NEAREST VISIBLE TURBINE 2.9mi

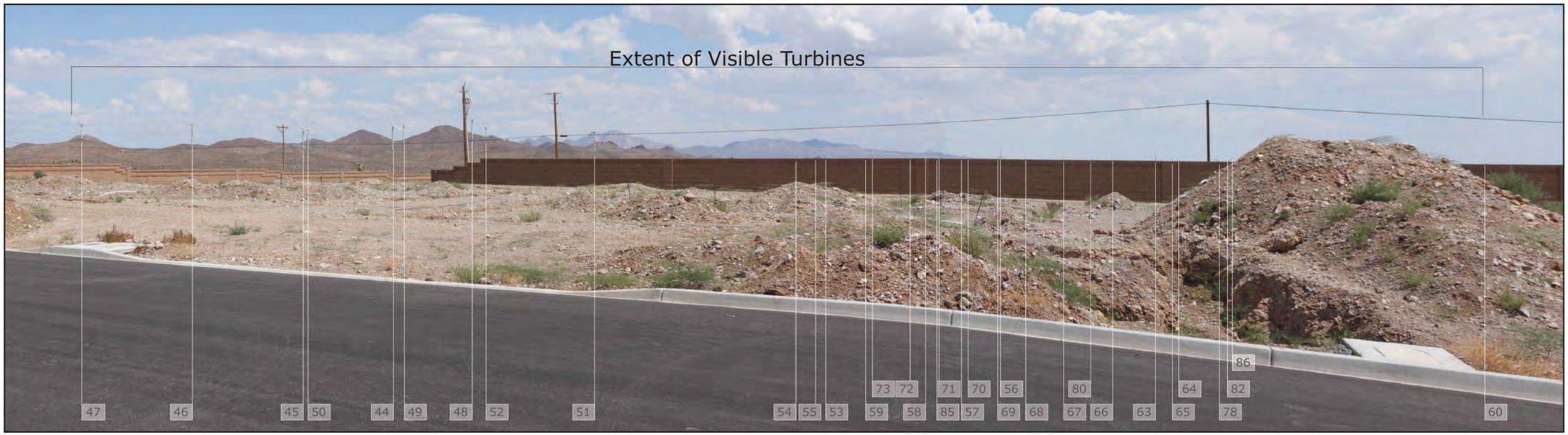
KOP07 - Searchlight Nugget Casino

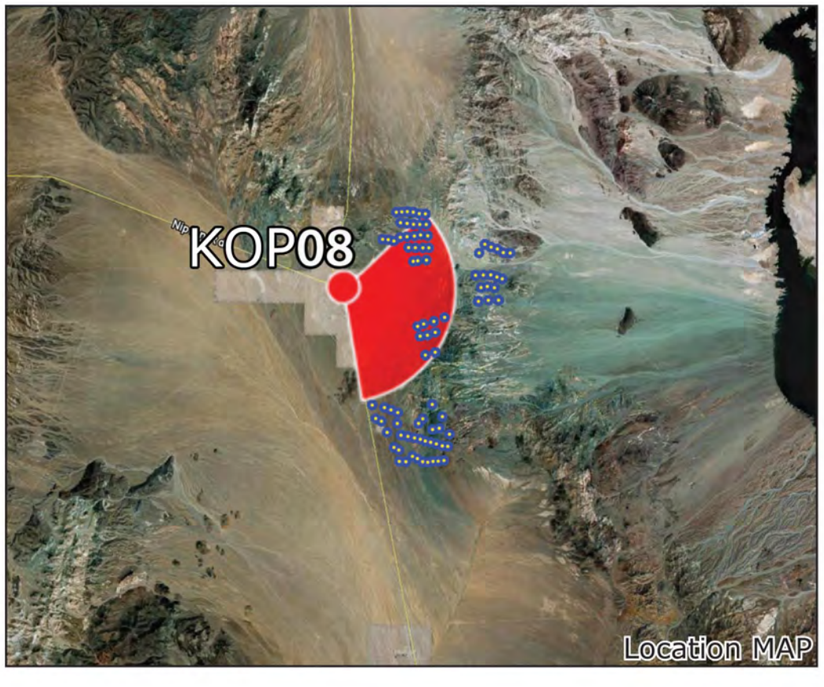


Extent of full TrueView™ simulation

DISTANCE TO NEAREST VISIBLE TURBINE 2.9mi

KOP08 - View from new residential area on west end of town. Sleep Cove between Lake Breeze and Shady Cove

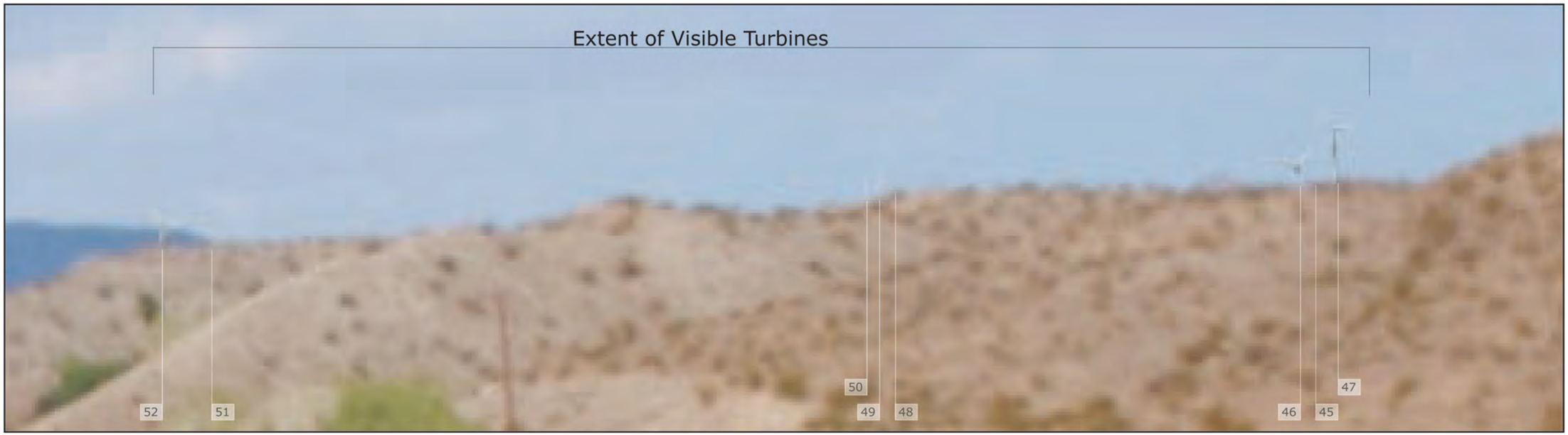


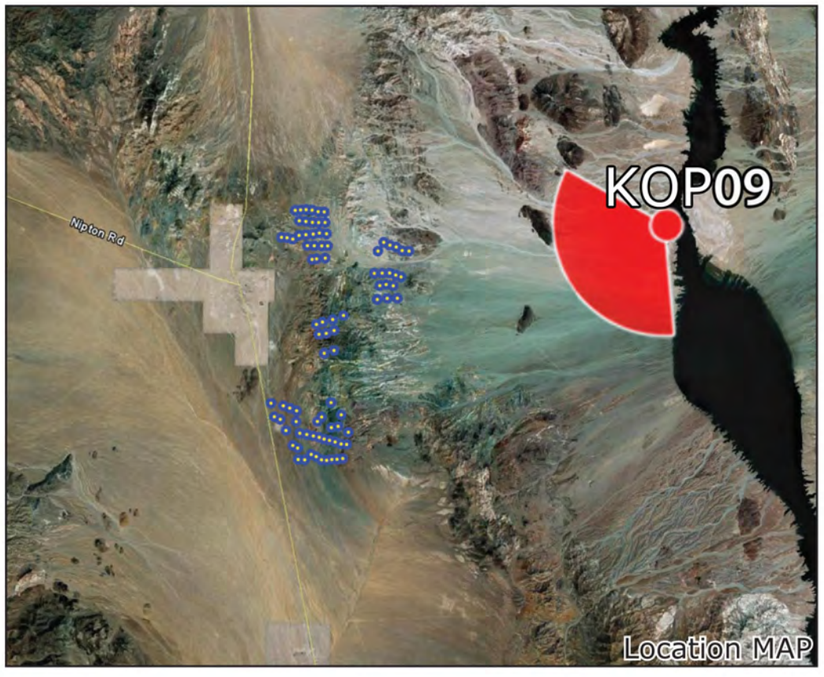


Extent of full TrueView™ simulation

DISTANCE TO NEAREST VISIBLE TURBINE 2.1mi

KOP09 - New dock/pier facility

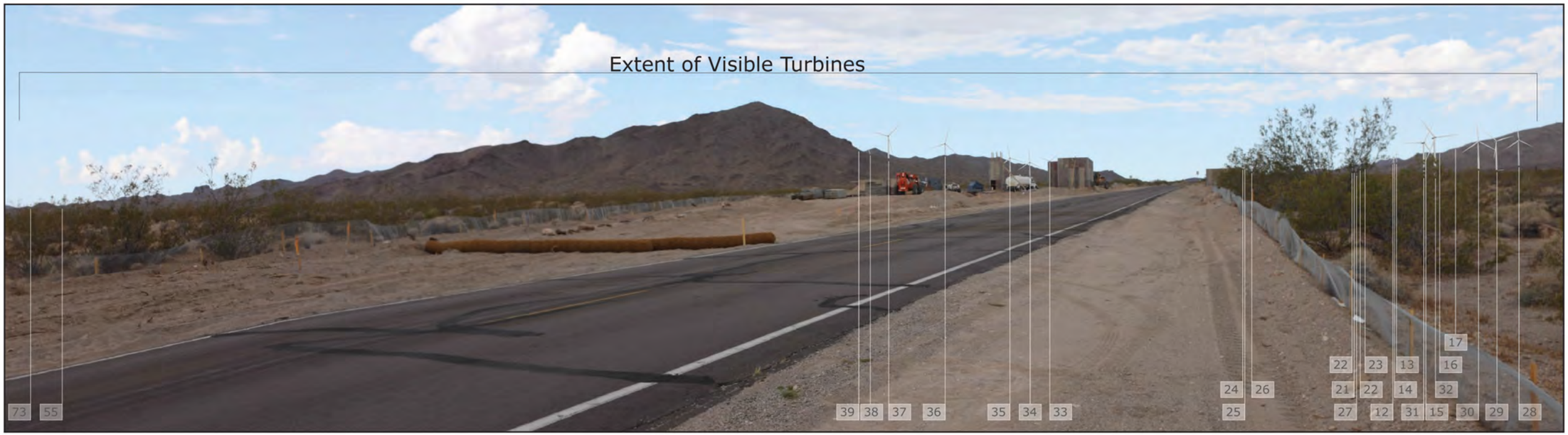


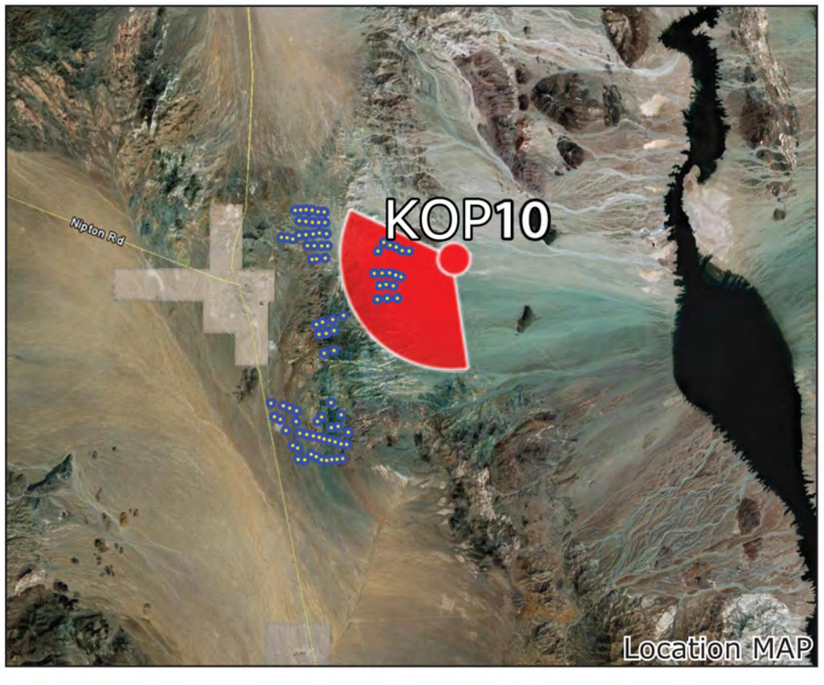


Extent of full TrueView™ simulation

DISTANCE TO NEAREST VISIBLE TURBINE 10.5mi

KOP10 - View east toward entrance station and turbines





Extent of full TrueView™ simulation

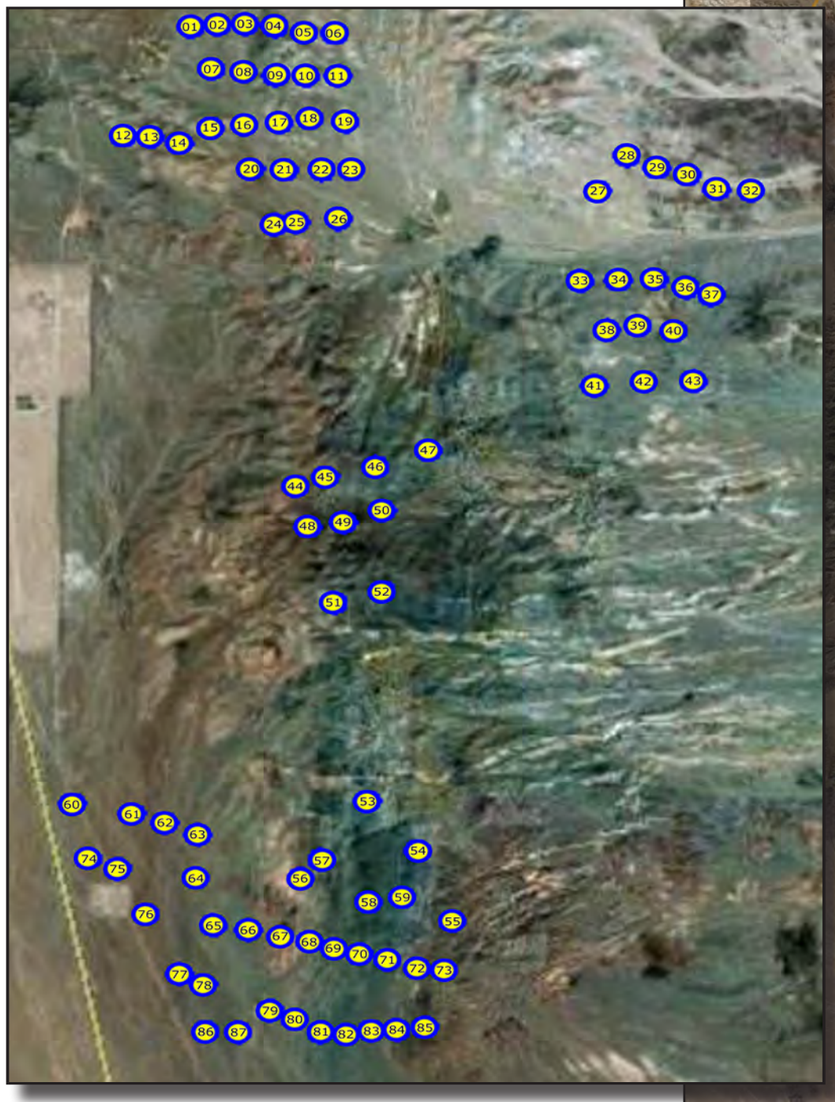
DISTANCE TO NEAREST VISIBLE TURBINE 1.4mi

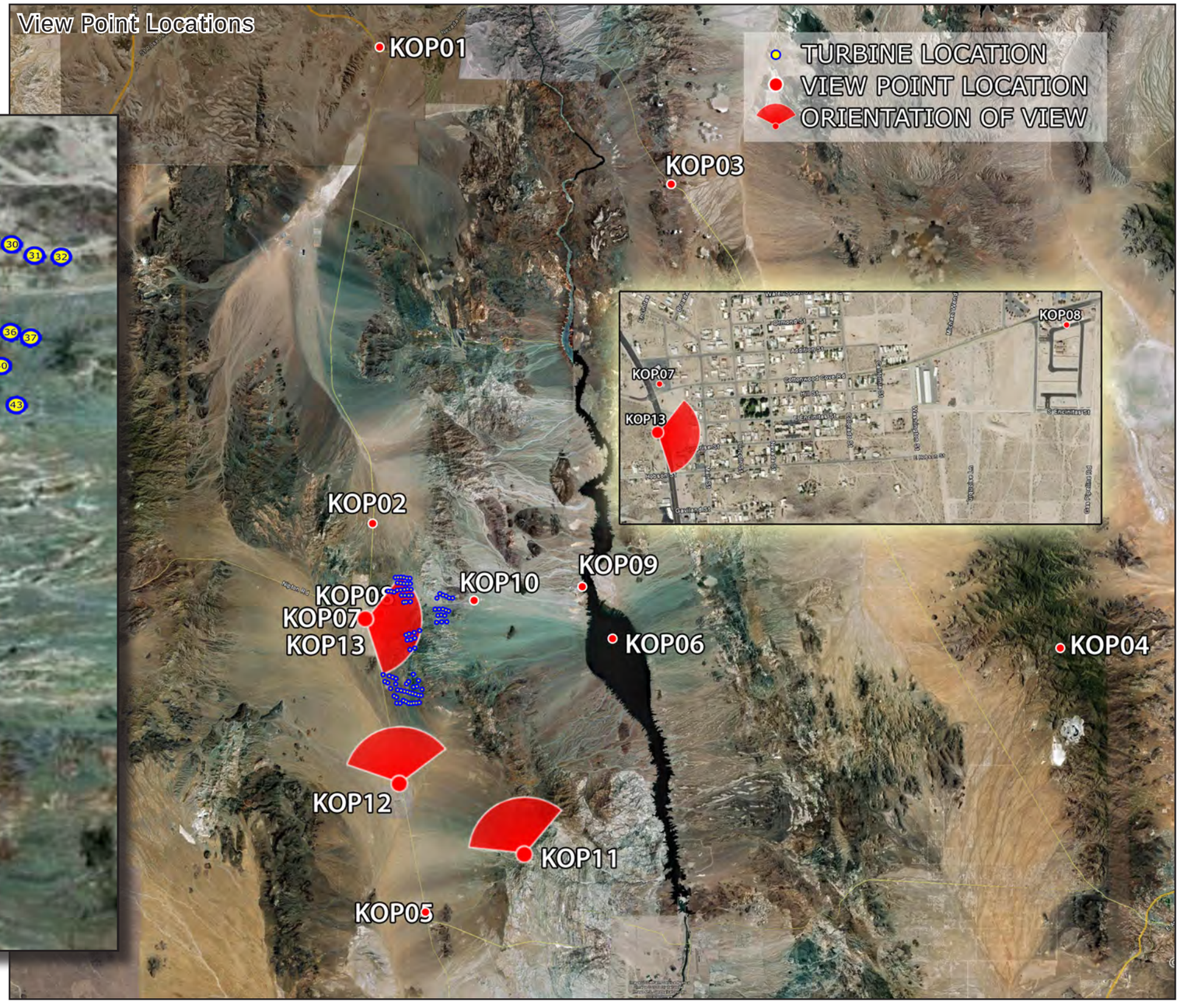
Duke Energy
Searchlight

www.truescape.com

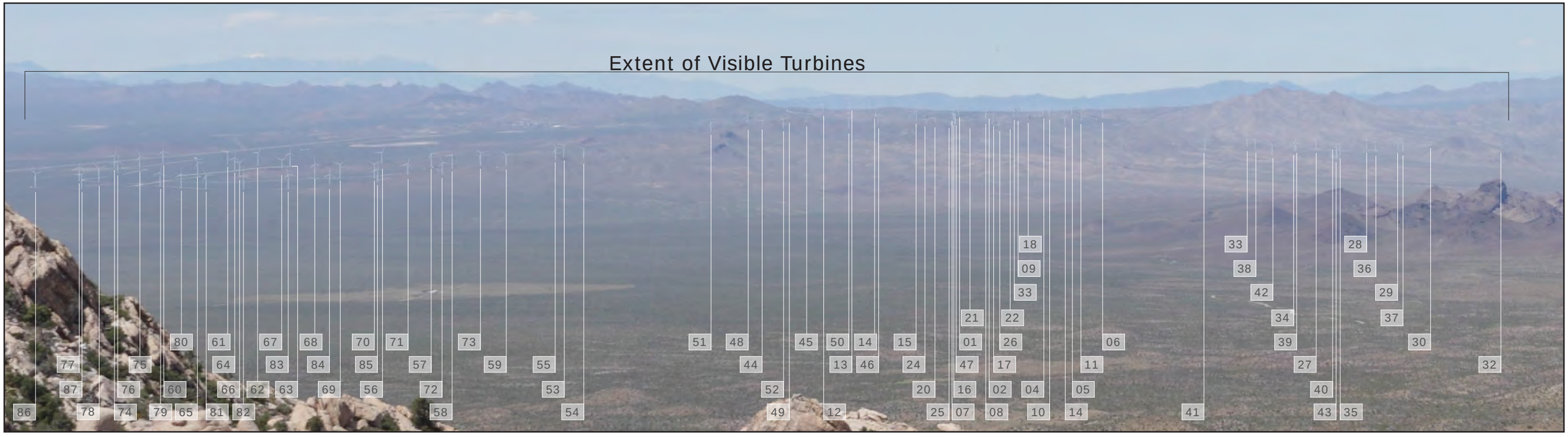
Viewpoint Locations

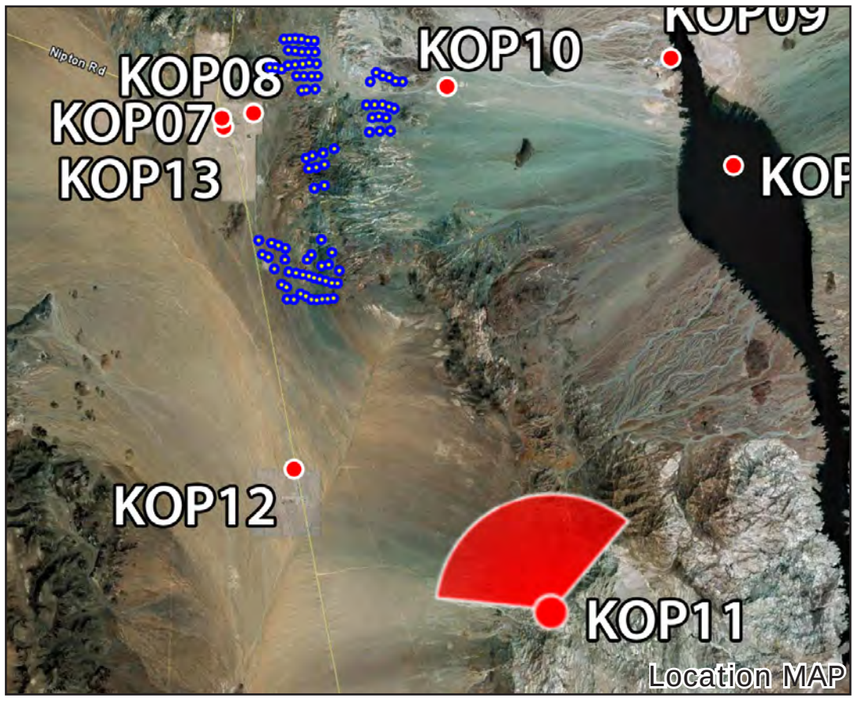
Turbine Layout





KOP11 - Comms towers near to Spirit mountain

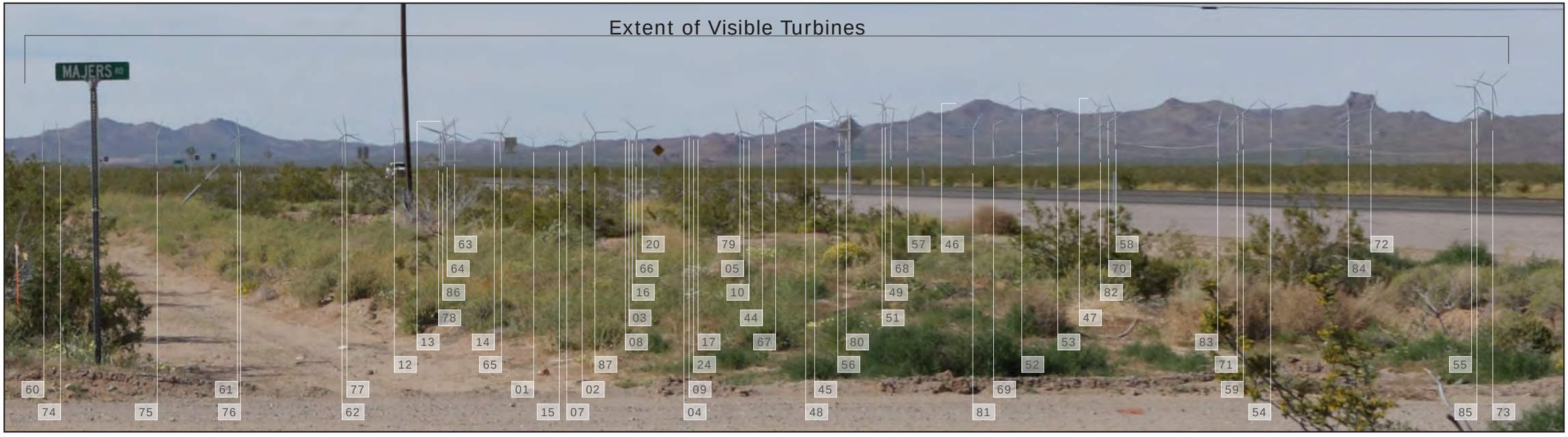


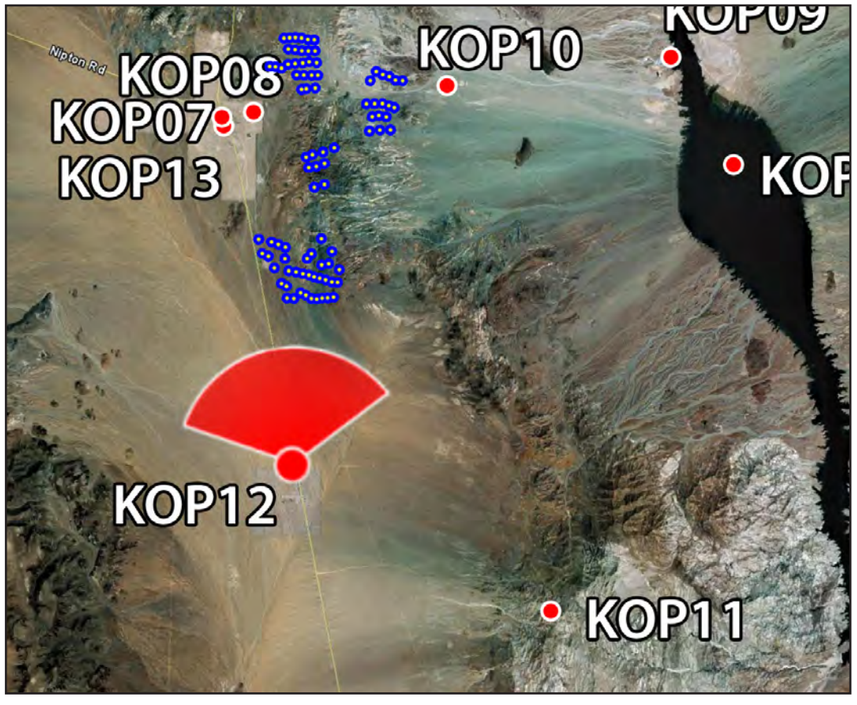


Extent of full TrueView™ simulation

DISTANCE TO NEAREST VISIBLE TURBINE 11.4mi

KOP12 - Looking north to Searchlight

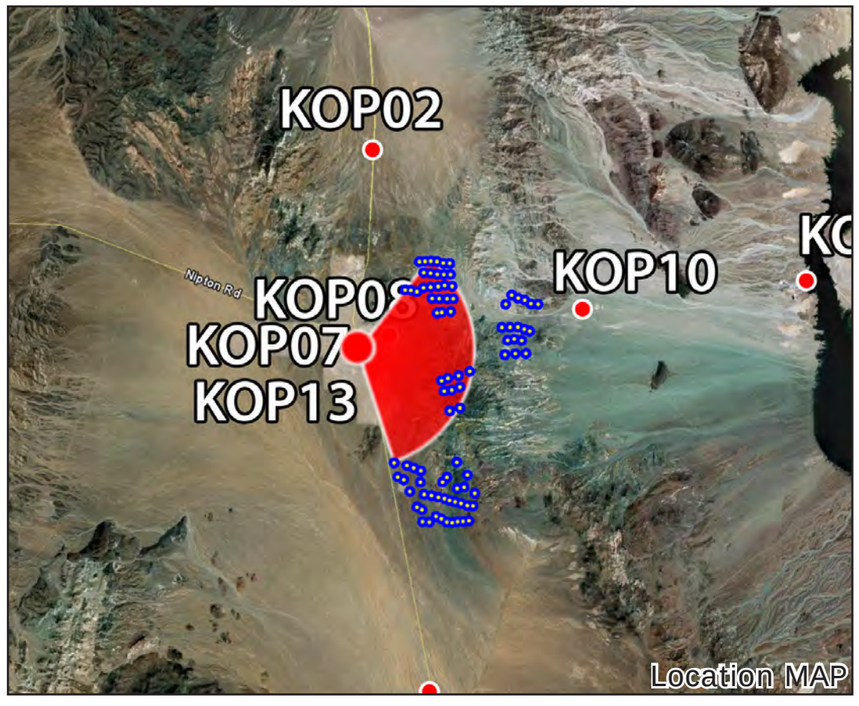




Extent of full TrueView™ simulation

DISTANCE TO NEAREST VISIBLE TURBINE 5.1mi

KOP13 - Outside Searchlight historic hospital



Extent of full TrueView™ simulation

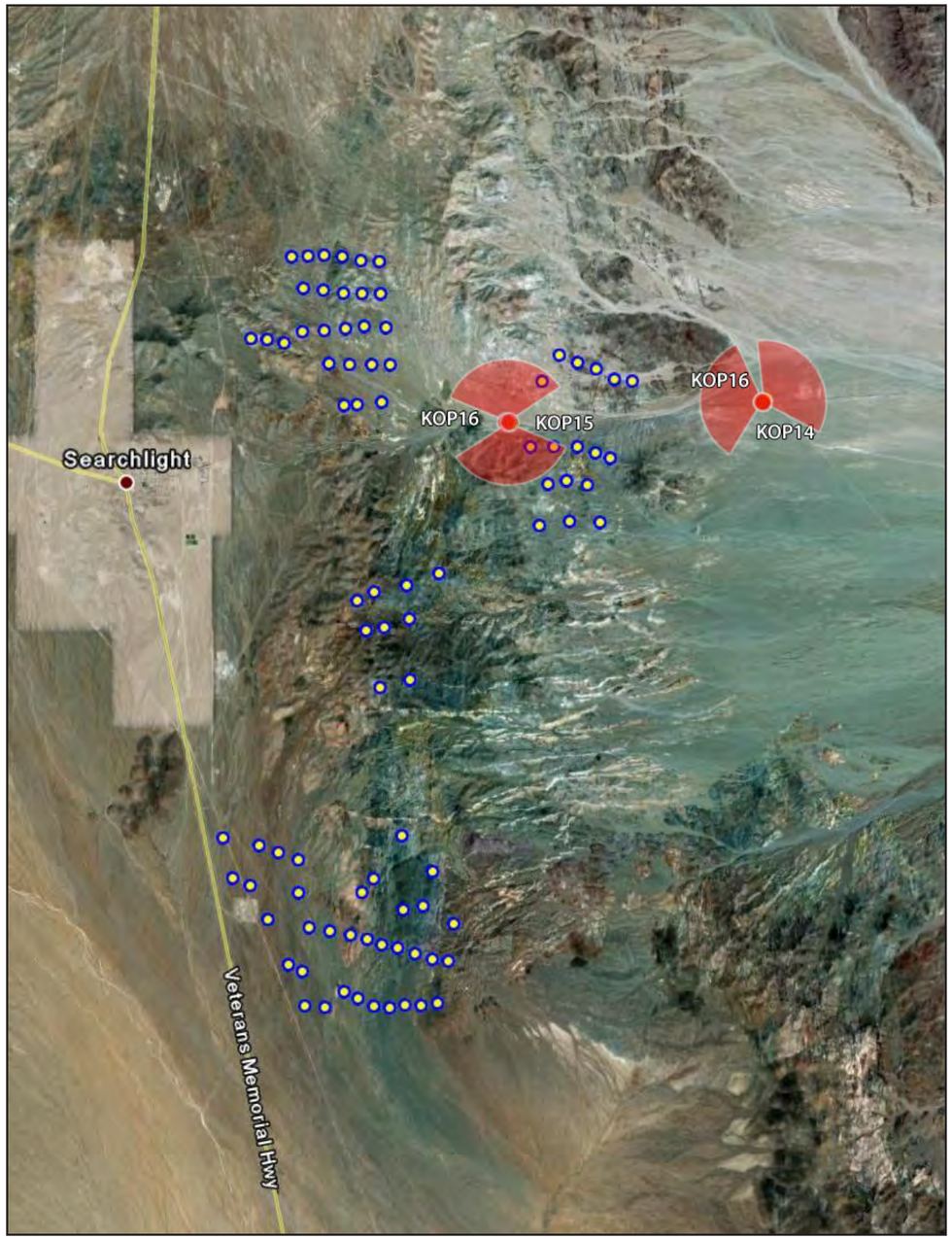
DISTANCE TO NEAREST VISIBLE TURBINE 2.1mi

TRUESCAPE
VISUAL COMMUNICATION

Duke Energy
Searchlight

www.truescape.com

Viewpoint Locations



Searchlight

KOP14 View from Cottonwood Cove Road looking West

KOP15 View from Cottonwood Cove Road looking South

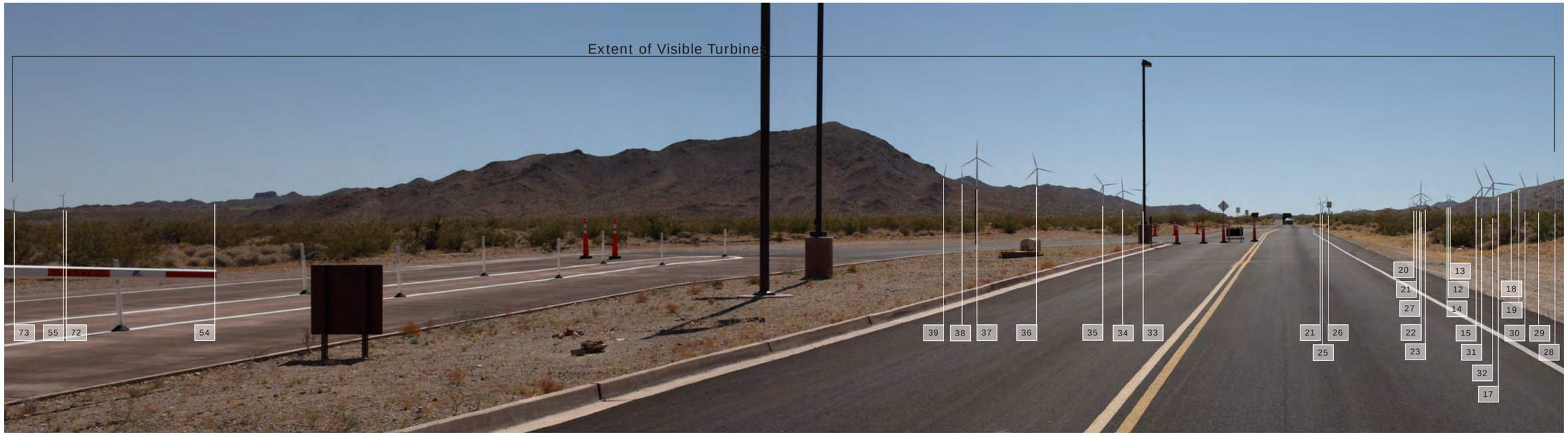
KOP16 View from Cottonwood Cove Road looking North

KOP17a View from Cottonwood Cove Road looking East - Option01

KOP17b View from Cottonwood Cove Road looking East - Option02

KOP17c View from Cottonwood Cove Road looking East - Option03

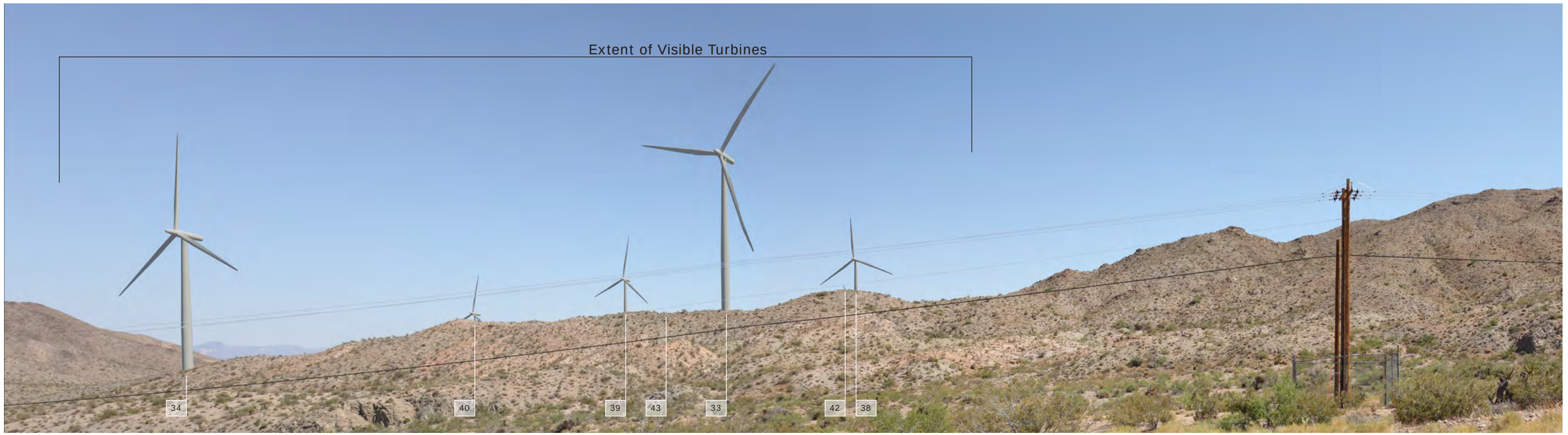
KOP14 - View from Cottonwood Cove Road looking West

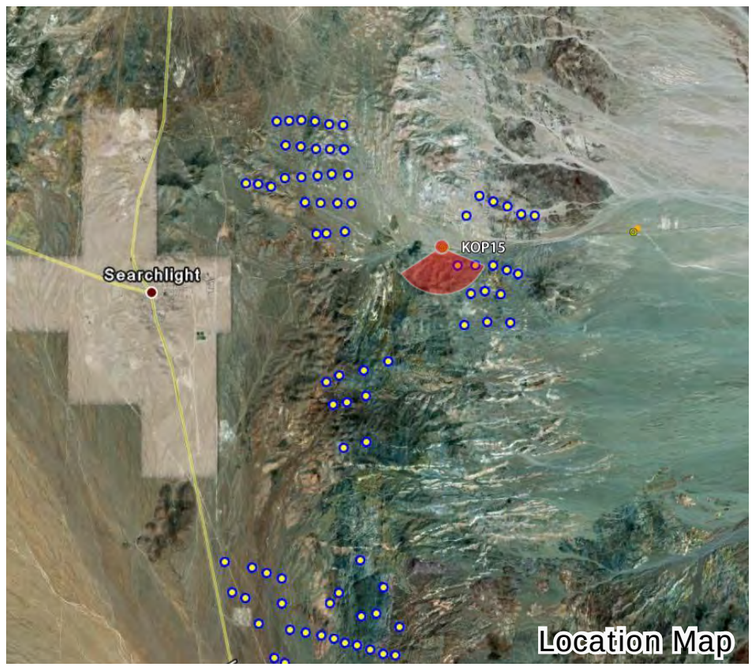


Entire Trueview

DISTANCE TO NEAREST VISIBLE TURBINE (Mi): 1.4

KOP15 - View from Cottonwood Cove Road looking South

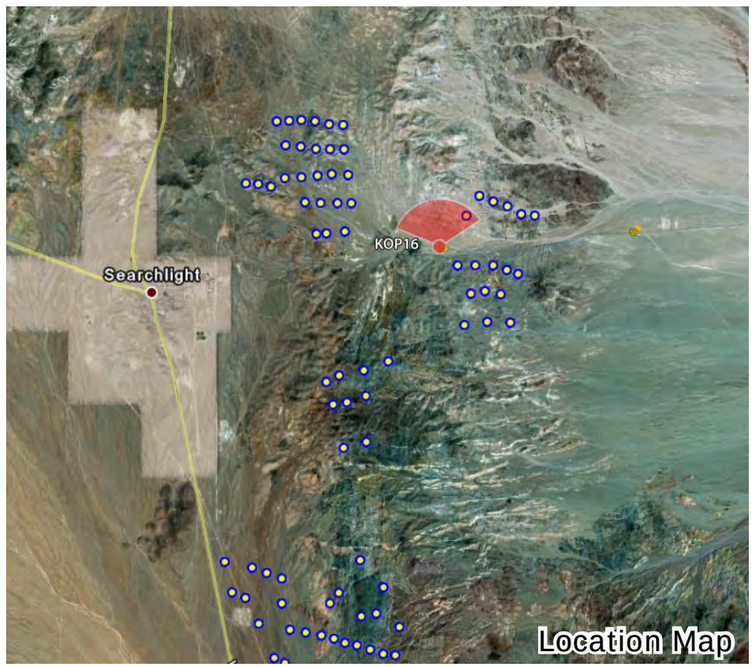




Entire Trueview

DISTANCE TO NEAREST VISIBLE TURBINE (Mi): 0.3

KOP16 - View from Cottonwood Cove Road looking North



Entire Trueview

DISTANCE TO NEAREST VISIBLE TURBINE (Mi): 0.6

KOP17a - View from Cottonwood Cove Road looking East - Option01

Entire Trueview

KOP17b - View from Cottonwood Cove Road looking East - Option02

Entire Trueview

KOP17c - View from Cottonwood Cove Road looking East - Option03

Entire Trueview

TABLE OF CONTENTS

SECTION 13.1--CONTRACTOR FURNISHED DATA

1. RECYCLED MATERIAL QUANTITY REPORT: Submit quantities for recycled material listed in Section 13.6, "Recycled Material Quantities", to the COR after completion and prior to submittal of final invoice.

2. RECOVERED MATERIAL AND BIOBASED PRODUCTS REPORT: Provide the COR the following information for purchases of items listed in Section 13.7, "Use of Recovered Material And Biobased Products":

   (1) Quantity and cost of listed items with recovered or biobased material content and quantity and cost of listed items without recovered or biobased material content after completion and prior to submittal of final invoice.

3. RECLAIMED REFRIGERANT RECEIPT: A receipt from the reclaimer stating that the refrigerant was reclaimed, the amount and type of refrigerant, and the date shall be submitted to the COR after completion and prior to submittal of final invoice in accordance with Section 13.8.5, –Refrigerants And Receipts".

4. WASTE MATERIAL QUANTITY REPORT: Submit quantities of total project waste material disposal as listed below to the COR after completion and prior to submittal of final invoice in accordance with Section 13.8.8, –Waste Material Quantity Report".

   (1) Sanitary Wastes: Volume in cubic yards or weight in pounds.

   (2) Hazardous or Universal Wastes: Weight in pounds.

   (3) PCB Wastes: Weight in pounds.

   (4) Other regulated wastes (e.g., lead-based paint or asbestos): Weight in pounds (specify type of waste in report).

5. SPILL PREVENTION NOTIFICATION AND CLEANUP PLAN (Plan): Submit the Plan as described in Section 13.10.2, "Spill Prevention Notification and Cleanup Plan", to the COR for approval 14 days prior to start of work. Approval of the Plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

6. TANKER OIL SPILL PREVENTION AND RESPONSE PLAN: Submit the Plan as described in Section 13.10.3, "Tanker Oil Spill Prevention and Response Plan", to the COR for approval 14 days prior to start of work. Approval of the Plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

7. PESTICIDE USE PLAN: Submit two copies of a pesticide use plan as described in Section 13.11.3, –Pesticide Use Plan", to the COR for approval 14 days prior to use. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. Within seven days after application, submit a written report in accordance with Standard 2 – Sitework, Section 2.1.1.5, –Soil-Applied Herbicide".

8. TREATED WOOD POLE AND MEMBERS RECYCLING CONSUMER INFORMATION RECEIPT: Submit treated wood pole and members consumer receipt forms to the COR after completion and prior to submittal of final invoice (see 13.12, –Treated Wood Poles and Members Recycling or Disposal").

9. PREVENTION OF AIR POLLUTION: Submit a copy of permits, if required, from Federal, State, or local agencies to the COR 14 days prior to the start of work.

10. ASBESTOS LICENSES OR CERTIFICATIONS: Submit a copy of licenses and/or certifications for asbestos work as described in 13.14, ~~"~~Handling and Management of Asbestos Containing Material" paragraph a., to the COR prior to work. Submit copies of certificates of disposal and/or receipts for waste to the COR after completion and prior to submittal of final invoice.

11. LEAD PAINT NOTICES: Submit a copy of lead paint notices as described in 13.15, ~~"~~Material with Lead-based Paint" paragraph b., to the COR upon completion and prior to submittal of final invoice. Submit copies of certificates of disposal and/or receipts for waste to the COR after completion and prior to submittal of final invoice.

12. WATER POLLUTION PERMITS: Submit copies of any water pollution permits as described in 13.16, ~~"~~Prevention of Water Pollution" paragraph b., to the COR prior to work.

13. PCB TEST REPORT: Submit a PCB test report as described in 13.17, ~~"~~Testing, Draining, Removal, and Disposal of Oil-filled Electrical Equipment" paragraph b., prior to draining, removal, or disposal of oil or oil-filled equipment that is designated for disposal.

14. OIL AND OIL-FILLED ELECTRICAL EQUIPMENT RECEIPT: Obtain and submit a receipt for oil and oil-filled equipment transported and disposed, recycled, or reprocessed as described in 13.17, ~~"~~Testing, Draining, Removal, and Disposal of Oil-filled Electrical Equipment", to the COR upon completion and prior to submittal of final invoice.

15. OSHA PCB TRAINING RECORDS: Submit employee training documentation records to the COR 14 days prior to the start of work as described in 13.18.1.

16. CLEANUP WORK MANAGEMENT PLAN: Submit a Cleanup Work Management Plan as described in 13.18, ~~"~~Removal of Oil-contaminated Material" paragraph b., to the COR for approval 14 days prior to the start of work. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

17. POST CLEANUP REPORT: Submit a Post-Cleanup Report as described in 13.18, ~~"~~Removal of Oil-contaminated Material" paragraph g., to the COR upon completion and prior to submittal of final invoice.

SECTION 13.2--ENVIRONMENTAL REQUIREMENTS

Comply with Federal, State, and local environmental laws and regulations. The sections in this Standard further specify the requirements.

SECTION 13.3--LANDSCAPE PRESERVATION

1. GENERAL: Preserve landscape features in accordance with the contract clause titled "Protection of Existing Vegetation, Structures, Equipment, Utilities, and Improvements."

2. CONSTRUCTION ROADS: Location, alignment, and grade of construction roads shall be subject to the COR's approval. When no longer required, construction roads shall be restored to their original condition. Surfaces of construction roads shall be scarified to facilitate natural revegetation, provide for proper drainage, and prevent erosion. If re-vegetation is required, use regionally native plants.

3. CONSTRUCTION FACILITIES: Shop, office, and yard areas shall be located and arranged in a manner to preserve trees and vegetation to the maximum practicable extent and prevent impact on sensitive riparian areas and flood plains. Storage and construction buildings, including concrete footings and slabs, shall be removed from the site prior to contract completion. The area shall be re-graded as required so that all surfaces drain naturally, blend with the natural terrain, and are left in a condition that will facilitate natural revegetation, provide for proper drainage, and prevent erosion or transport of sediment and pollutants. If re-vegetation is required, use regionally native plants.

SECTION 13.4--PRESERVATION OF CULTURAL AND PALEONTOLOGICAL RESOURCES

1. GENERAL: Do not remove or alter cultural artifacts or paleontological resources (fossils). Cultural artifacts may be of scientific or cultural importance and include bones, pottery, glass, projectile points (arrowheads), other stone or metal tools, historic buildings, and features. Paleontological resources can be of scientific importance and include mineralized animals and plants or trace fossils such as footprints. Both cultural and paleontological resources are protected by Federal Regulations during Federal construction projects. Contractor must always stay within Western's right-of-way and/or easement.

2. KNOWN CULTURAL OR PALEONTOLOGICAL SITES: Following issuance of notice to proceed, Western will provide two sets of plan and profile drawings showing sensitive areas located on or immediately adjacent to the transmission line right-of-way and/or facility. These areas shall be considered avoidance areas. Prior to any construction activity, the avoidance areas shall be marked on the ground in a manner approved by the COR. Instruct employees, subcontractors, and others that vehicular or equipment access to these areas is prohibited. If access is absolutely necessary, first obtain approval from the COR. Western will remove the markings during or following final cleanup. For some project work, Western will require an archaeological, paleontological or tribal monitor at or near cultural or paleontological site locations. The contractor shall work with the monitor to insure that sensitive locations are avoided. Where monitors are required, the monitor shall meet with the crew each morning to go over the day's work. The monitor will also conduct awareness training for all contractors prior to any work in the field. Untrained personnel shall not be allowed in the construction area. For areas designated as sensitive and requiring a monitor, the contractor may not access those areas without a monitor being present.

3. UNKNOWN CULTURAL OR PALEONTOLOGICAL SITES: On rare occasions cultural or paleontological sites may be discovered during excavation or other earth-moving activities.

   (1) Reporting: If evidence of a cultural or paleontological site is discovered, cease work in the area immediately and notify the COR of the location and nature of the findings. If a monitor is present, the monitor should also be notified. Stop all activities within a 200-foot radius of the discovery and do not proceed with work within that radius until directed to do so by the COR.

   (2) Care of Evidence: Protect the area. Do not remove, handle, alter, or damage artifacts or fossils uncovered during construction.

SECTION 13.5--NOXIOUS WEED CONTROL

1. GENERAL: Comply with Federal, state, and local noxious weed control regulations. Provide a "clean vehicle policy" while entering and leaving construction areas to prevent transport of noxious weed plants and/or seed. Transport only construction vehicles that are free of mud and vegetation debris to staging areas and the project right-of-way.

SECTION 13.6--RECYCLED MATERIAL QUANTITIES

1. GENERAL: Record quantities of the following material by category that is salvaged, recycled, reused, or reprocessed:

   (1) Transformers, Breakers: Weight without oil.

   (2) Electrical Conductors: Length in feet and Type (for example, ACSR, Copper, and gauge).

   (3) Steel: Weight in pounds or tons.

   (4) Aluminum: Weight in pounds or tons

   (5) Copper: Weight in pounds or tons..

   (6) Other Metals: Weight in pounds or tons.

   (7) Oil: Gallons (separate by type - less than 2 ppm PCB, 2 to 50 ppm PCB, and 50 or greater ppm PCB).

   (8) Gravel, Asphalt, Or Concrete: Weight in pounds or tons.

   (9) Batteries: Weight in pounds.

   (10) Wood Poles and Crossarms: Weight in pounds.

   (11) Wood construction material: Weight in pounds.

   (12) Cardboard: Weight in pounds.

   (13) Porcelain insulators: Weight in pounds.

2. RECYCLED MATERIAL QUANTITY REPORT: Submit quantities for recycled material listed above to the COR after completion and prior to submittal of final invoice.

SECTION 13.7--USE OF RECOVERED MATERIAL AND BIOBASED PRODUCTS

1. RECOVERED MATERIAL PRODUCTS: If the products listed below are obtained as part of this project, purchase the items with the highest recovered material content possible unless recovered material products are not available: 1) competitively within a reasonable time frame; 2) meeting reasonable performance standards as defined in the Standards or Project Specifications; or 3) at a reasonable price.

   (1) Construction Products:

      1) Building Insulation Products.

      2) Carpet.

      3) Carpet cushion.

      4) Cement and concrete containing coal fly ash, ground granulated blast furnace slag, cenospheres, or silica fume.

      5) Consolidated and reprocessed latex paint.

      6) Floor Tiles.

      7) Flowable fill.

      8) Laminated Paperboard.

      9) Modular threshold ramps.

      10) Nonpressure pipe.

      11) Patio Blocks.

      12) Railroad grade crossing surfaces.

      13) Roofing materials.

      14) Shower and restroom dividers/partitions.

      15) Structural Fiberboard.

   (2) Landscaping Products:

      1) Compost made from yard trimmings or food waste.
      2) Garden and soaker hoses.
      3) Hydraulic Mulch.
      4) Lawn and garden edging.
      5) Plastic lumber landscaping timbers and posts.

   (3) Non-paper Office Products:

      1) Binders, clipboards, file folders, clip portfolios, and presentation folders.
      2) Office furniture.
      3) Office recycling containers.
      4) Office waste receptacles.
      5) Plastic desktop accessories.

6) Plastic envelopes.
7) Plastic trash bags.
8) Printer ribbons.
9) Toner cartridges.

(4) Paper and Paper Products:

1) Commercial/industrial sanitary tissue products.
2) Miscellaneous papers.
3) Newsprint.
4) Paperboard and packaging products.
5) Printing and writing papers.

(5) Park and Recreation Products:

1) Park benches and picnic tables.
2) Plastic fencing.
3) Playground equipment.
4) Playground surfaces.
5) Running tracks.

(6) Transportation Products:

1) Channelizers.
2) Delineators.
3) Flexible delineators.
4) Parking stops.
5) Traffic barricades.
6) Traffic cones.

(7) Vehicular Products:

1) Engine coolants.
2) Rebuilt Vehicular Parts.
3) Re-refined lubricating oils.
4) Retread tires.

(8) Miscellaneous Products:

1) Awards and plaques.
2) Bike racks.
3) Blasting grit.
4) Industrial drums.
5) Manual-grade strapping.
6) Mats.
7) Pallets.
8) Signage.
9) Sorbents.

(9) For a complete listing of products and recommendations for recovered content, see http://www.epa.gov/cpg/products.htm

2. BIOBASED PRODUCTS: If the products listed below are obtained as part of this project, purchase the items with the highest biobased content possible and no less than the percent indicated for each product unless biobased products are not available: 1) competitively within a reasonable

time frame; 2) meeting reasonable performance standards as defined in the Standards or Project Specifications; or 3) at a reasonable price.

(1) Mobile Equipment Hydraulic Fluids (minimum 24% biobased content).

(2) Urethane Roof Coatings (minimum 62% biobased content).

(3) Water Tank Coatings (minimum 62% biobased content).

(4) Diesel Fuel Additives (minimum 93% biobased content).

(5) Penetrating Lubricants (minimum 71% biobased content).

(6) Bedding, Bed Linens, and Towels (minimum 18% biobased content).

(7) Adhesive and mastic removers 58%.

(8) Plastic insulating foam for residential and commercial construction 7%.

(9) Hand cleaners and sanitizers.

1) Hand cleaners—64 %
2) Hand sanitizers (including hand cleaners and sanitizers)—73 %

(10) Composite panels.

1) Plastic lumber composite panels—23 %
2) Acoustical composite panels—37 %
3) Interior panels—55 %
4) Structural interior panels—89 %
5) Structural wall panels—94 %

(11) Fluid-filled transformers.

1) Synthetic ester-based fluid-filled transformers—66 %
2) Vegetable oil-based fluid-filled transformers—95 %

(12) Disposable containers 72%.

(13) Fertilizers 71%.

(14) Sorbents 89%.

(15) Graffiti and grease removers 34%.

(16) 2-Cycle engine oils 34%.

(17) Lip care products 82%.

(18) Films (used in packaging, wrappings, linings, and other similar applications).

1) Semi-durable films—45%
2) Non-durable films—85%

(19) Stationary equipment hydraulic Fluids 44%.

(20) Disposable cutlery 48%.

(21) Glass cleaners 49%.

(22) Greases.

1) Food grade grease—42%
2) Multipurpose grease—72%
3) Rail track grease—30%
4) Truck grease—71%
5) Greases not elsewhere specified—75%

(23) Dust suppressants 85%.

(24) Carpets 7%.

(25) Carpet and upholstery cleaners.

1) General purpose cleaners—54%
2) Spot removers—7%

(26) Bathroom and spa cleaners 74%.

(27) Concrete and asphalt release fluids 87%.

(28) General purpose de-icers 93%.

(29) Firearm lubricants 49%.

(30) Floor strippers 78%.

(31) Laundry products.

1) Pretreatment/spot removers—46%
2) General purpose laundry products—34%

(32) Metalworking fluids.

1) Straight oils—66%
2) General purpose soluble, semisynthetic, and synthetic oils—57%
3) High performance soluble, semisynthetic, and synthetic oils—40%

(33) Wood and concrete sealers.

1) Penetrating liquids—79%
2) Membrane concrete sealers—11%

For additional information regarding biobased products, see **http://www.biobased.oce.usda.gov**

3. RECOVERED MATERIAL AND BIOBASED PRODUCTS REPORT: Provide the COR the following information for purchases of those items listed above:

(1) Quantity and cost of listed items with recovered or biobased material content and quantity and cost of listed items without recovered or biobased material content after completion and prior to submittal of final invoice.

(2) Written justification 7 work days prior to purchase of listed items if recovered material or biobased products are not available: 1) competitively within a reasonable time frame; 2) meeting reasonable performance standards as defined in the Standards or Project Specifications; or 3) at a reasonable price.

SECTION 13.8--DISPOSAL OF WASTE MATERIAL

1. GENERAL: Dispose or recycle waste material in accordance with applicable Federal, State and Local regulations and ordinances. In addition to the requirements of the Contract Clause –Cleaning Up", remove all waste material from the construction site. No waste shall be left on Western property, right-of-way, or easement. Burning or burying of waste material is not permitted.

2. HAZARDOUS, UNIVERSAL, AND NON-HAZARDOUS WASTES: Manage hazardous, universal, and non-hazardous wastes in accordance with State and Federal regulations.

3. USED OIL: Used oil generated from the Contractor activities shall be managed in accordance with used oil regulations.

4. RECYCLABLE MATERIAL: Reduce wastes, including excess Western material, by recycling, reusing, or reprocessing. Examples of recycling, reusing, or reprocessing include reprocessing of solvents; recycling cardboard; and salvaging scrap metals.

5. REFRIGERANTS AND RECEIPTS: Refrigerants from air conditioners, water coolers, refrigerators, ice machines and vehicles shall be reclaimed with certified equipment operated by certified technicians if the item is to be disposed. Refrigerants shall be reclaimed and not vented to the atmosphere. A receipt from the reclaimer stating that the refrigerant was reclaimed, the amount and type of refrigerant, and the date shall be submitted to the COR after completion and prior to submittal of final invoice.

6. HALONS: Equipment containing halons that must be tested, maintained, serviced, repaired, or disposed must be handled according to EPA requirements and by technicians trained according to those requirements.

7. SULFUR HEXAFLOURIDE (SF_6): SF_6 shall be reclaimed and not vented to the atmosphere.

8. WASTE MATERIAL QUANTITY REPORT: Submit quantities of total project waste material disposal as listed below to the COR after completion and prior to submittal of final invoice.

   (1) Sanitary Wastes: Volume in cubic yards or weight in pounds.

   (2) Hazardous or Universal Wastes: Weight in pounds.

   (3) PCB Wastes: Weight in pounds.

   (4) Other regulated wastes (e.g., lead-based paint or asbestos): Weight in pounds (specify type of waste in report).

SECTION 13.9--CONTRACTOR'S LIABILITY FOR REGULATED MATERIAL INCIDENTS

1. GENERAL: The Contractor is solely liable for all expenses related to spills, mishandling, or incidents of regulated material attributable to his actions or the actions of his subcontractors. This includes all response, investigation, cleanup, disposal, permitting, reporting, and requirements from applicable environmental regulation agencies.

2. SUPERVISION: The actions of the Contractor employees, agents, and subcontractors shall be properly managed at all times on Western property or while transporting Western's (or previously owned by Western) regulated material and equipment.

SECTION 13.10--POLLUTANT SPILL PREVENTION, NOTIFICATION, AND CLEANUP

1. GENERAL: Provide measures to prevent spills of pollutants and respond appropriately if a spill occurs. A pollutant includes any hazardous or non-hazardous substance that when spilled, will contaminate soil, surface water, or ground water. This includes any solvent, fuel, oil, paint, pesticide, engine coolants, and similar substances.

2. SPILL PREVENTION NOTIFICATION AND CLEANUP PLAN (Plan): Provide the Plan to the COR for approval 14 days prior to start of work. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. Include the following in the Plan:

   (1) Spill Prevention measures. Describe the work practices or precautions that will be used at the job site to prevent spills. These may include engineered or manufactured techniques such as installation of berms around fuel and oil tanks; Storage of fuels, paints, and other substances in spill proof containers; and management techniques such as requiring workers to handle material in certain ways.

   (2) Notification. Most States and the Environmental Protection Agency require by regulation, that anyone who spills certain types of pollutants in certain quantities notify them of the spill within a specific time period. Some of these agencies require written follow up reports and cleanup reports. Include in the Plan, the types of spills for which notification would be made, the agencies notified, the information the agency requires during the notification, and the telephone numbers for notification.

   (3) Employee Awareness Training. Describe employee awareness training procedures that will be implemented to ensure personnel are knowledgeable about the contents of the Plan and the need for notification.

   (4) Commitment of Manpower, Equipment and Material. Identify the arrangements made to respond to spills, including the commitment of manpower, equipment and material.

   (5) If applicable, address all requirements of 40CFR112 pertaining to Spill Prevention, Control and Countermeasures Plans.

3. TANKER OIL SPILL PREVENTION AND RESPONSE PLAN: Provide a Tanker Oil Spill Prevention and Response Plan as required by the Department of Transportation if oil tankers with volume of 3,500 gallons or more are used as part of the project. Submit the Tanker Oil Spill Prevention and Response Plan to the COR for approval 14 days prior to start of work. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations.

SECTION 13.11--PESTICIDES

1. GENERAL: The term "pesticide" includes herbicides, insecticides, rodenticides and fungicides. Pesticides shall only be used in accordance with their labeling and applied by appropriately certified applicators.

2. ENVIRONMENTAL PROTECTION AGENCY REGISTRATION: Use EPA registered pesticides that are approved for the intended use.

3. PESTICIDE USE PLAN: The plan shall contain: 1) a description of the pesticide to be used, 2) where it is to be applied, 3) the application rate, 4) a copy of the label, and 5) a copy of required applicator certifications. Submit two copies of the pesticide use plan to the COR for approval 14 days prior to the date of intended application. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. Within seven days after application, submit a written report, including the pesticide applicators report, in accordance with Standard 2 – Sitework, Section 2.1.1.5, "Soil-Applied Herbicide".

SECTION 13.12--TREATED WOOD POLES AND MEMBERS RECYCLING OR DISPOSAL

Whenever practicable, treated wood poles and members removed during the project shall be recycled or transferred to the public for some uses. Treated wood poles and members transferred to a recycler, landfill, or the public shall be accompanied by a written consumer information sheet on treated wood as provided by Western. Obtain a receipt form, part of the consumer information sheet, from the recipient indicating that they have received, read, and understand the consumer information sheet. Treated wood products transferred to right-of-way landowners shall be moved off the right-of-way. Treated wood product scrap or poles and members that cannot be donated or reused shall be properly disposed in a landfill that accepts treated wood and has signed Western's consumer information sheet receipt. Submit treated wood pole and members consumer receipt forms to the COR after completion and prior to submittal of final invoice.

SECTION 13.13--PREVENTION OF AIR POLLUTION

1. GENERAL: Ensure that construction activities and the operation of equipment are undertaken to reduce the emission of air pollutants. Submit a copy of permits, if required, from Federal, State, or local agencies to the COR 14 days prior to the start of work.

2. MACHINERY AIR EMISSIONS: The Contractor and subcontractor machinery shall have, and shall use the air emissions control devices required by Federal, State or Local Regulation or ordinance.

3. DUST ABATEMENT: Dust shall be controlled. Oil shall not be used as a dust suppressant. Dust suppressants shall be approved by the COR prior to use.

SECTION 13.14--HANDLING AND MANAGEMENT OF ASBESTOS CONTAINING MATERIAL

1. GENERAL: Obtain the appropriate Federal, State, Tribal or local licenses or certifications prior to disturbing any regulated asbestos-containing material. If a building or portion of a building will be demolished or renovated, obtain an Asbestos Notice of and Permit for Demolition and Renovation from the State or Tribal Department of Environmental Quality, Division of Air Quality (or equivalent). The building(s) shall be inspected by a State-Certified or Tribal accepted Asbestos Building Inspector and the inspector shall certify the presence and condition of asbestos on site as directed on the State or Tribal Demolition and Renovation Notice/Permit. The inspections shall be performed and notifications shall be submitted whether asbestos is present or not. Submit a copy of licenses, certifications, Demolition and Renovation Notifications and Permits for asbestos work to the COR 14 days prior to work. Ensure: 1) worker and public safety requirements are fully implemented and 2) proper handling, transportation, and disposal of asbestos containing material.

2. TRANSPORTATION OF ASBESTOS WASTE: Comply with Department of Transportation, Environmental Protection Agency, and State and Local requirements when transporting asbestos wastes.

3. CERTIFICATES OF DISPOSAL AND RECEIPTS: Obtain certificates of disposal for waste if the waste is a hazardous waste or receipts if the waste is a non-hazardous waste. Submit copies to the COR after completion and prior to submittal of final invoice.

SECTION 13.15--MATERIAL WITH LEAD-BASED PAINT

1. GENERAL: Comply with all applicable Federal, State and local regulations concerning work with lead-based paint, disposal of material painted with lead-based paint, and management of these material. OSHA and General Industry Standards apply to worker safety and right-to-know issues. Federal EPA and State agencies regulate waste disposal and air quality issues.

2. TRANSFER OF PROPERTY: If lead-based paint containing equipment or material is to be given away or sold for reuse, scrap, or reclaiming, a written notice shall be provided to the recipient of the material stating that the material contains lead-based paint and the Hazardous Waste regulations may apply to the waste or the paint in some circumstances. The new owner must also be notified that they may be responsible for compliance with OSHA requirements if the material is to be cut, sanded, abraded, or stripped of paint. Submit a copy of lead paint notices to the COR upon completion and prior to submittal of final invoice.

3. CERTIFICATES OF DISPOSAL AND RECEIPTS: Obtain certificate of disposals for waste if the waste is a hazardous waste or receipts if the waste is a non-hazardous waste. Submit copies to the COR after completion and prior to submittal of final invoice.

SECTION 13.16--PREVENTION OF WATER POLLUTION

1. GENERAL: Ensure that surface and ground water is protected from pollution caused by construction activities and comply with applicable regulations and requirements. Ensure that streams, waterways and other courses are not obstructed or impaired unless the appropriate Federal, State or local permits have been obtained.

2. PERMITS: Ensure that:

   (1) A National Pollutant Discharge Elimination System (NPDES) permit is obtained from the US Environmental Protection Agency or State as appropriate if the disturbed construction area equals 1 acre or more. Disturbed areas include staging, parking, fueling, stockpiling, and any other construction related activities. Refer to www.epa.gov/npdes/stormwater for directions and forms.

   (2) A dewatering permit is obtained from the appropriate agency if required for construction dewatering activities.

   (3) Copies of permits and plans, approved by the appropriate regulating agencies, are submitted to the COR 14 days prior to start of work.

3. EXCAVATED MATERIAL AND OTHER CONTAMINANT SOURCES: Control runoff from excavated areas and piles of excavated material, construction material or wastes (to include truck washing and concrete wastes), and chemical products such as oil, grease, solvents, fuels, pesticides, and pole treatment compounds. Excavated material or other construction material shall not be stockpiled or deposited near or on streambanks, lake shorelines, ditches, irrigation canals, or other areas where run-off could impact the environment.

4. MANAGEMENT OF WASTE CONCRETE OR WASHING OF CONCRETE TRUCKS: Do not permit the washing of concrete trucks or disposal of excess concrete in any ditch, canal, stream, or other surface water. Concrete wastes shall be disposed in accordance with all Federal, State, and local regulations. Concrete wastes shall not be disposed on any Western property, right-of-way, or easement; nor on any streets, roads, or property without the owner's consent.

5. STREAM CROSSINGS: Crossing of any stream or other waterway shall be done in compliance with Federal, State, and local regulations. Crossing of some waterways may be prohibited by landowners, State or Federal agencies or require permits.

SECTION 13.17--TESTING, DRAINING, REMOVAL, AND DISPOSAL OF OIL-FILLED ELECTRICAL EQUIPMENT

1. SAMPLING AND TESTING OF INSULATING OIL FOR PCB CONTENT: Sample and analyze the oil of electrical equipment (which includes storage tanks) for PCB's. Use analytical methods approved by EPA and applicable State regulations. Decontaminate sampling equipment according to documented good laboratory practices (these can be contractor developed or EPA standards). Use only laboratories approved by Western. The COR will furnish a list of approved laboratories.

2. PCB TEST REPORT: Provide PCB test reports that contain the information below for disposing of oil-filled electrical equipment. Submit the PCB test report prior to draining, removal, or disposal of oil or oil-filled equipment that is designated for disposal.

   (1) Name and address of the laboratory.

   (2) Description of the electrical equipment (e.g. transformer, breaker).

   (3) Serial number for the electrical equipment.

   (4) Date sampled.

   (5) Date tested.

   (6) PCB contents in parts per million (ppm).

   (7) Unique identification number of container into which the oil was drained (i.e., number of drum, tank, tanker, etc.)

3. OIL CONTAINING PCB: Comply with the Federal regulations pertaining to PCBs found at Title 40, Part 761 of the U.S. Code of Federal Regulations (40 CFR 761).

4. REMOVAL AND DISPOSAL OF INSULATING OIL AND OIL-FILLED ELECTRICAL EQUIPMENT: Once the PCB content of the oil has been identified from laboratory results, the oil shall be transported and disposed, recycled, or reprocessed according to 40 CFR 761 (if applicable), Resource Conservation and Recovery Act (RCRA) ~~u~~sed oil", and other applicable regulations. Used oil may be transported only by EPA-registered used oil transporters. The oil must be stored in containers that are labeled ~~U~~sed Oil." Use only U.S. transporters and disposal sites approved by Western.

5. OIL AND OIL-FILLED ELECTRICAL EQUIPMENT RECEIPT: Obtain and submit a receipt for oil and oil-filled equipment transported and disposed, recycled, or reprocessed to the COR upon completion and prior to submittal of final invoice.

SECTION 13.18--REMOVAL OF OIL-CONTAMINATED MATERIAL

1. GENERAL: Removing oil-contaminated material includes excavating, stockpiling, testing, transporting, cleaning, and disposing of these material. Personnel working with PCBs shall be trained in accordance with OSHA requirements. Submit employee training documentation records to the COR 14 days prior to the start of work.

2. CLEANUP WORK MANAGEMENT PLAN: Provide a Cleanup Work Management Plan that has been approved by applicable Federal, State, or Local environmental regulation agencies. Submit the plan to the COR for approval 14 days prior to the start of work. Approval of the plan is for the purpose of determining compliance with the specifications only and shall not relieve the Contractor of the responsibility for compliance with all Federal, State, and Local regulations. The plan shall address on-site excavation of contaminated soil and debris and include the following:

   (1) Identification of contaminants and areas to be excavated.
   (2) Method of excavation.
   (3) Level of personnel/subcontractor training.
   (4) Safety and health provisions.
   (5) Sampling requirements including quality control, laboratory to be used.
   (6) Management of excavated soils and debris.
   (7) Disposal methods, including transportation to disposal.

3. EXCAVATION AND CLEANUP: Comply with the requirements of Title 40, Part 761 of the U.S. Code of Federal Regulations (40 CFR 761).

4. TEMPORARY STOCKPILING: Excavated material, temporarily stockpiled on site, shall be stored on heavy plastic and covered to prevent wind and rain erosion at a location designated by the COR.

5. SAMPLING AND TESTING: Sample contaminated debris and areas of excavation to ensure that contamination is removed. Use personnel with experience in sampling and, in particular, with experience in PCB cleanup if PCBs are involved. Use analytical methods approved by EPA and applicable State regulations.

6. TRANSPORTION AND DISPOSAL OF CONTAMINATED MATERIAL: The Contractor shall be responsible and liable for the proper loading, transportation, and disposal of contaminated material according to Federal, State, and local requirements. Use only U.S. transporters and disposal sites approved by Western.

7. POST CLEANUP REPORT: Provide a Post-Cleanup Report that describes the cleanup of contaminated soils and debris. Submit the report to the COR upon completion and prior to submittal of final invoice. The report shall contain the following information:

   (1) Site map showing the areas cleaned.

   (2) Description of the operations involved in excavating, storing, sampling, and testing, and disposal.

   (3) - Sampling and analysis results including:

      1) Name and address of the laboratory;
      2) sample locations;
      3) sample dates;
      4) analysis dates;
      5) contents of contaminant (e.g., PCB or total petroleum hydrocarbons) in parts per million (ppm).

(4) Certification by the Contractor that the cleanup requirements were met.

(5) Copies of any manifests, bills of lading, and disposal certificates.

(6) Copies of correspondence with regulatory agencies that support completion of the cleanup.

SECTION 13.19--CONSERVATION OF NATURAL RESOURCES

1. GENERAL: Federal law prohibits the taking of endangered, threatened, proposed or candidate wildlife and plants, and destruction or adverse modification of designated Critical Habitat. Federal law also prohibits the taking of birds protected by the Migratory Bird Treaty Act, and the Bald and Golden Eagle Protection Act. ~~"T~~"take" means to pursue, hunt, shoot, wound, kill, trap, capture or collect a protected animal or any part thereof, or attempt to do any of those things. The Contractor will take reasonable precaution to avoid harming other wildlife species. Contractor must always stay within Western's right-of-way and/or easement.

2. KNOWN OCCURRENCE OF PROTECTED SPECIES OR HABITAT: Following issuance of the notice to proceed, and prior to the start of construction, Western will provide training to all contractor and subcontractor personnel involved in the construction activity. Untrained personnel shall not be allowed in the construction area. Western will provide two sets of plan and profile drawings showing sensitive areas located on or immediately adjacent to the transmission line right-of-way and/or facility. These areas shall be considered avoidance areas. Prior to any construction activity, the avoidance areas shall be marked on the ground in a manner approved by the COR. If access is absolutely necessary, the contractor shall first obtain permission from the COR, noting that a Western and/or other government or tribal agency biologist may be required to accompany personnel and equipment. Ground markings shall be maintained through the duration of the contract. Western will remove the markings during or following final inspection of the project.

3. UNKNOWN OCCURRENCE OF PROTECTED SPECIES OR HABITAT: If evidence of a protected species is found in the project area, the contractor shall immediately notify the COR and provide the location and nature of the findings. The contractor shall stop all activity in the vicinity of the protected species or habitat and not proceed until directed to do so by the COR.

Appendix E: Visual Simulations and Contrast Rating Forms

Appendix F: Literature Review of Socioeconomic Effects of Wind Project and Transmission Lines

Prepared for"

The Bureau of Land Management
For the Searchlight Wind Energy Project

Prepared by

Bootstrap Solutions
752 E. Braemere Road
Boise, ID 83702

Literature on Property Value Impacts of Wind Projects

The economic effects of wind energy projects have been well documented. Several studies that have evaluated potential property value impacts are highlighted below (organized chronologically). No clear inference can be drawn from these studies and available research as the analyses vary in terms of rigor; methodology (e.g., survey sampling, statistical analysis, and expert opinion); size, location and site character of projects analyzed; and results and conclusions. However, the preponderance of research on this issue suggests that there is no negative relationship between wind energy developments and property values.

1. Jordal-Jorgensen, J. (1996). "Visual Effect and Noise from Windmills – Quantifying and Valuation. "Social Assessment of Wind Power in Denmark. The Institute of Local Government Studies (AKF). April 1996.

The first empirical study specifically addressing the potential impact of wind turbines on property values was based on property values in Denmark in 1996. In this study, the opinions of homeowners were used to derive a monetary value (in 1996 Dutch Kroners) for two contingencies. First, 342 homeowners living "near" windmills in Denmark were asked if they find windmills a nuisance, and if so, how much would they be willing to pay to have them removed. A total of (13%) homeowners from the sample of 342 thought that windmills were indeed a nuisance, and collectively they were willing to pay the equivalent of $140 (1996 US Dollars) annually to have them removed. Secondly, the same 342 homeowners were asked to indicate how much they would be willing to pay to NOT live near a windmill. Of the 26 homeowners (%) who provided a nonzero response to this question, the price they would be willing to pay to not live "near" a windmill ranged from an equivalent $2,314 to $13,429 (1996 US Dollars). The term "near" remained subjective and undefined in the survey. It was inferred by the author that house values were lower when in close proximity to windmills than for other houses located further away. The lack of statistical controls with respect to this study's sampling, definition of terms, and analysis render its results anecdotal at best. The author candidly admits that the small number of houses located near the

wind turbines, coupled with the low proportion of that group who responded to the survey questions, produce a result that is in no way statistically significant and could be "due to coincidental factors".

2. Grover, D. S. (2002). "Economic Impacts of Wind Power in Kittitas County, WA. " ECONorthwest for Phoenix Economic Development Group. 1-18. November 2002.

The first comprehensive look at the impact of wind turbines on property values was conducted in 2002 by ECONorthwest for a proposed wind turbine project in Kittitas County, Washington. This study is notable for segmenting the broader economic impacts of wind turbines into now familiar categories: property values, economic impacts and tax revenues. The property values section of their study consisted, in turn, of two separate analyses. First, they interviewed 13 county tax assessors from the 13 counties where a total of 22 wind turbines had been installed in the previous ten years. Six of those counties had residential properties that were in view of the turbines, another six had no residential properties in view of the turbines, and the 13th county had not completely installed its wind turbines to make a determination regarding the view shed. Assessors in five of the six counties with residential views stated that they had not determined any negative impact on property values. Hoen (2006, page 8) concludes in his review of this study that "…the fact that residents did not complain (correlation) does not mean conclusively that property values are not affected (causation)". The second strategy employed by ECONorthwest to assess the impact of wind turbines on property values was a literature review of peer-reviewed journal articles. Their review found only the 1996 Danish study by Jordal-Jorgensen (see above item #1) meeting their criteria for inclusion.

3. Sterzinger, G., F. Beck, et al. (2003). "The Effect of Wind Development on Local Property Values." Renewable Energy Policy Project. 1-77. May 2003. http://www.repp.org/articles/static/1/binaries/wind_online_final.pdf [Viewed 8-11-08].

Probably the best known wind farm study, and certainly the most rigorous up to that time, appeared in 2003. The Renewable Energy Policy Project (REPP) studied ten wind farm projects located in California, New York, Texas, Vermont, Wisconsin, Pennsylvania, and Iowa. They used monthly property sales data to answer three related research questions: (1) how did prices change over the entire period of the study for sales occurring in the viewshed and outside of the viewshed of the turbines. The viewshed was defined as a five-mile radius beginning at the point of the outermost turbine; (2) how did prices change within the viewshed before and after the projects came on-line; and (3) how prices changed for both the viewshed and a comparable region, but only for the period of time after the turbines came on-line. The comparable areas used as controls for this third question were defined as reasonably close communities with similar demographic, economic, and geographic characteristics and trends compared to properties within the viewshed, but located outside of any wind turbine viewshed area.

The REPP researchers used simple regression analysis to estimate how the rate of property value change was affected in each of the cases. The study found no significant empirical support that property values were diminished in any of the ten case studies from around the country. Interestingly, the study also found that for most of the project areas the property values rose more quickly in the viewshed than they did in the comparable community; that values increased faster in the viewshed after the projects came on-line

than they did before; and finally, that after projects came on-line, values increased faster in the viewshed than they did in the comparable community. For 26 of the 30 individual scenarios analyzed, property values in the affected viewshed rose more than in comparable communities.

While this study is often quoted, it has been criticized methodologically along four different lines: (1) no attempt is made to discern which of the properties within a 5-mile viewshed can actually see the windfarm; (2) the viewshed impact is categorical, in that no attempt is made to control for distance to the turbines. That is, the viewshed "impact" is the same, whether the property is adjacent to the windfarm or farther away (up to five miles); (3) the sole reliance on the R^2 statistic is flawed, especially when very low values of that statistic are relied upon; and (4) the universe of property transactions was analyzed without further refinement or filtering out of those transactions not occurring "at will", due to such circumstances as estate sales, divorce, sale to family members, etc. (Hoen 2006, p16-17).

4. Haughton, J., D. Giuffre, et al. (2004). "An Economic Analysis of a Wind Farm in Nantucket Sound." Beacon Hill Institute at Suffolk University. 2-83. May 1, 2004 http://www.beaconhill.org/BHIStudies/Windmills2004/WindFarmArmyCorps.pdf [Viewed 8-11-08].

Shortly after release of the above cited REPP study, citizen groups opposed to development of a windfarm in Nantucket Sound coalesced around researchers Haughton and Giuffre and David G. Tuerck's Beacon Hill Institute, commissioning a survey of 45 real estate agents and 501 residents of Cape Cod and Martha's Vineyard. While this study was the first survey of the impact of windfarms on property values in the US since the 1980's, its publication was met with a polarized reception based on its findings.

The study concluded, perhaps prematurely, that the presence of a large scale windfarm on Nantucket Sound could be perceived as a loss in amenity value. Twenty-one percent of the residents and 49% of the realtors reported a negative, adverse expectation of property value decline. For the resident group, the 21% with negative expectations thought that property values would decline by between 4% and 10%, with the higher amount reflected along waterfront property. The 49% of realtors with negative expectations thought values would decline an average of 4.6%.

As late as 2007, the results of this opinion study have been utilized by opponents of windfarms. In an article written by journalist Wendy Williams, she quotes one extrapolation of the study's findings: "It is estimated that property values in the six affected towns would fall by 4 percent. This represents a loss of $1.35 billion in property values, or almost twice the cost of the windmill project". Williams then elaborates on the methods used by the Beacon Hill Institute when interviewing local residents: "…Tuerck's surveyors showed 501 homeowners in the six towns around the Sound photo simulations of what the offshore wind project would allegedly look like from their homes. Then the team asked homeowners if they thought their properties might drop in value once Cape Wind was built. Sampling a group that has been constantly assaulted with doom-and-gloom anti-windfarm hysteria for several years is unlikely to yield a useful result. Even so, 79% of interviewees said they did not expect a drop in home value – a fact which is not mentioned in the Institute's summary and study analysis". Wendy Williams is co-author, with Robert Whitcomb, of Cape Wind: Money, Celebrity, Class, Politics and the Battle for Our

Energy Future on Nantucket Sound. The Op-Ed piece cited above appeared Providence (Rhode Island) Journal, June 27, 2007.

The important contribution of this study is that it attempts to legitimize perceived declines in property values as worthy of analysis in its own right, thus evading criticism that such perceptions may or may not reflect actual changes in property values. In subsequent years, the pursuit of documentation regarding perceptions about property value impacts remains as strong as the pursuit of documentation regarding the impact of windfarms on actual property values and transactions.

5. DeLacy, P. Barton. A LULU of a Case: Gauging Property Value Impacts in Rural Areas. Real Estate Issues, Fall 2004.

Both chronologically and substantively, Barton DeLacy's article for the online journal Real Estate Issues marks the next significant contribution to our understanding of this issue. While his article is not an empirical review of any particular wind turbine project, it represents the reflections and views of an experienced researcher.

DeLacy includes windfarms within the group of Locally Undesirable Land Uses (hence the acronym LULU), exemplified by prisons, landfills, power transmission lines, and toxic waste sites. All of these land uses, when initially proposed, can trigger environmental impact statements (EIS, EA, etc.) and elicit excruciatingly detailed public information based on attitude, opinion, perception, expectations, and the like. Experts, he says, are asked to provide a before-and-after valuation theory to a particular affected area for a particular proposed land use, often without access or reference to empirical market transactions. Particularly in rural areas, where the number of residential properties is low to begin with, the corresponding ratio of actual transactions is even lower, with the number of such transactions occurring in close proximity to the LULU approaching zero.

Case studies of LULU's in urban areas have established that stigma, noise, and even toxic emissions do not influence property values much beyond a two-mile radius, while negative perceptions and attitudes about the LULU might suggest otherwise. For rural areas, and with particular reference to windfarms, he makes the point that land most nearly adjacent to the LULU is usually provided a lease or other compensation, with buffers and restrictions extending the proximity of residential structures to beyond one mile.

DeLacy further legitimizes the concept of stigma and other perceived impacts as legitimate concerns that impact the marketability of a property. Stigma (what can (cannot?) be seen, smelled, heard, etc.) has much more to do with reputation and with the intangible components of human desire than with easily measured variables including distance, line of sight, earshot, etc.

He further distinguishes the impact of stigma from a LULU on residential properties in a rural setting from a LULU on primarily agricultural properties in the same setting. Whereas residential property is sensitive to nuance, reputation, and other intangibles connected with mountain views, access and frontage on a stream, and the like, farmland is bought and sold based on its productivity and utility. Farmland, because of its expanse and comparatively lower unit values (compared to urban land) has seldom been found to be affected by structures, so long as no material damage can be shown. Farmland does lose value

if its water rights are revoked or its soil turns fallow. The presence of transmission towers or windmills does not adversely affect value because the parcels are too large with too low a unit value to be sensitive to that type of influence. In addition, the lease arrangements that typically involve large parcels of agricultural private land for such structures provide the owner with compensation far in excess of any calculated production value for the acreage involved.

He concludes his article with three generalizations: (1) Property values seem resilient, particularly in areas with sustained population growth; (2) the value of large parcels in agricultural use (multiple acreage) seem far more likely to be affected by production and transaction factors (like the availability of water and the costs of mortgage financing) than indirect impacts from LULU's; (3) property values in rural areas will be most affected by local employment and the presence of recreational opportunities.

6. Poletti, P. (2005). "A Real Estate Study of the Proposed Forward Wind Energy Center Dodge and Fond DuLac Counties, Wisconsin." Prepared for Invenergy Wind LLC. May 2005. http://psc.wi.gov/apps/erf_share/view/viewdoc.aspx?docid=35184 [Viewed 8-12-08].

The purpose of Poletti's report was to determine if the proposed Forward Wind Energy Center is located so as to minimize any adverse effect on the character of the surrounding area and on surrounding property values. The study area consisted of Dodge and Fondulac counties of Wisconsin, and a broader, "control area" extending into Illinois. The analysis was based on expert opinion and relied on a detailed review of the subject property and plans for the proposed wind energy center; on-site inspection of the subject property and surrounding area; inspection of other wind development sites; a review of uses and property values of surrounding tracts of land, including data on real estate transactions; and discussion with various assessors.

Poletti's analysis does cull out transactions that were not arms-length, thus improving on the methodology of Sterzinger, et. al. (2003). It also excludes sales of homes built before 1960 in an effort to control for house-specific characteristics such as construction quality, amenities and condition. Poletti examined roughly 300 sales that occurred in and around the two windfarms. He comes to the cautious conclusion that "there is not sufficient evidence in the data to warrant rejection of the claim that windfarms have an effect on property values." Any effect that is evidenced in the study, however, would seem to suggest an overall positive, though insignificant impact.

Poletti compares average values of properties surrounding the windfarms, which he entitles the "target area", with those in a "control area" which is outside the view of the windfarm. However, Poletti does not attempt to measure to what degree, if any, homes can actually see the windfarm. The author describes the area surrounding the windfarms as rolling with potentially obscuring features, so the implication is that some of the properties in the "target area" have no view of the windfarm. Further, no effort is made to control for distance from the windfarm.

This study is notable for the rigor and expertise brought by the author, who has wide professional experience evaluating changes in residential property values resulting from windfarm and other developments. Poletti's methodology resists the opportunity to over-use the available transaction data. For example, he is criticized by Hoen (2006) for not controlling for distance to a turbine, even though

such controls would render his otherwise statistically sound techniques unreliable due to diminishing cell sizes.

7. Hoen, B. "Impacts of Windmill Visibility on Property Values in Madison County, New York", Submitted to the Faculty of the Bard Center for Environmental Policy. Prepared in partial fulfillment of the requirements for the degree of Master of Science in Environmental Policy, Bard College, April 30, 2006.

Hoen's M.A. thesis represents the most statistically rigorous analysis of property value effects from wind energy projects to date. Its methods were later refined in a series of ongoing continuation studies that are reported here as Wiser and Hoen (2007), below. This study is also notable for its thorough review of the literature and its careful treatment of methodological and definitional issues.

Hoen's study focuses on the property value impacts of the Fenner wind energy project in Madison County, New York. It analyzed 280 arms-length single-family residential sales in the vicinity of the proposed wind development using a hedonic regression model. The sales occurred between 1996 and 2005 (140 transactions occurred after facility construction began in 2001) and were within 5 miles of the 20 turbines/30 megawatt (MW) wind development. None of the home sales were on properties that contained turbines, and none of the properties were compensated for the operation of the turbines. This study is unique in that all properties in the database were visited to "ground-truth" the actual level of turbine visibility.

The hedonic regression model focuses on two key characteristics: view of and distance from turbines, and combines them with a number of house and neighborhood characteristics to estimate the specific effect on home sales prices of the view of and distance from turbines. Although the model provides a strong statistical explanation of home values, the analysis concludes that there are no statistically-measurable effects of wind farm visibility on property values, even for those properties located within one mile of the facility and those that sold immediately following the announcement and construction of the wind farm.

Despite its methodological rigor, careful literature review, and treatment of a wide range of definitional issues, opponents of windfarms have attacked the study as "a college kid's thesis" and advised Mr. Hoen to "go back to Statistics 101". To date the scientific and professional community has been less critical of his study.

8. DeLacy, P. B. "Impacts of The Dairy Hills Wind Farm Project on Local Property Values". Technical Memorandum prepared for Dairy Hills Wind Farm, LLC and the Town of Perry, by Cushman & Wakefield, Inc. May 26, 2006, File No.: 06-34001-9104. Copy available via internet through third party archival source: http://www.maine.gov/doc/mfs/windpower/pubs [Viewed 12-3-08]

   DeLacy, P. B., "Evaluating Impacts of Wind Power Projects on Local Property Values". Technical Memorandum prepared for UPC Wind Management, LLC and the Cohocton Planning Board, by Cushman & Wakefield, Inc. November 17, 2006. File No.: 06-34001-9569B. http://www.dutchhillwind.com [Viewed 8-15-08].

These two technical memoranda are publicly available illustrations of the research approach taken by P. Barton DeLacy, a nationally known consultant, currently of Cushman & Wakefield of Oregon, Inc. The first of the two research illustrations involves the Dairy Hills windfarm, located near the towns of Covington, Perry, and Warsaw; all in Wyoming County, New York. The Dutch Hill project focuses on an area around the town of Cohocton in Steuben County, New York.

In both cases, DeLacy's contracted work is submitted as a Technical Memorandum and Appendix to the EIS connected with the respective windfarm proposals, and his methodological approach remains consistent. They are included in this review of literature for two reasons: (1) they have been involved in numerous assessments of the property value impacts of windfarms; and (2) their approach focuses on assessing property value impacts in sparsely populated and rural areas. Rural and sparsely populated areas are not amenable to the preferred statistical methodologies involving regression analysis, which in turn require a very large volume of property transactions for their proper use.

The methodological approach involves four dimensions of information gathering and analysis: (1) Review of the dominant literature pertaining to the property value impacts of windfarms and wind turbines, with particular emphasis on identifying and applying aspects of that literature with strongest bearing and utility for the study at hand; (2) Review of the numerous Technical Memoranda conducted by both their own firm and by other firms, with emphasis on defining commonalities between and among the findings pertaining to sites most similar to the study at hand; (3) a thorough analysis of local property transactions within the windfarm viewshed going back at least two or three years; onsite inspections of all properties bought and sold; collection and analysis of building permits, construction patterns, and land sales and leasing patterns occurring over several recent years within the siting area; and (4) demographic profiling of the area's population, labor force and employment, industry base, and general economic conditions.

9. Economic Impacts of the Hatchet Ridge Wind Project. Prepared for Hatchet Ridge Wind, LLC, a subsidiary of RES Americas Inc. 700 SW Taylor St. Suite 210, Portland, OR 97205. Prepared by Economics Group of ENTRIX, Inc., 12009 N.E. 99th Street, Suite 1410, Vancouver, WA 98682-2497, November 5, 2007.

A recent windfarm development is underway in the rural portion of eastern Shasta County, California. Early scoping documents do not include a systematic or empirical review of either actual property sales transactions or surveys of local real estate professionals and assessors. The project is nonetheless included in this review because of its location in a sparsely settled rural area of the northwest is similar to that of the China Mountain area.

To date, the approach taken by ENTRIX has been exploratory, relying heavily on insights to be gained from a thorough literature review, coupled with ongoing appreciation of the conflicting pressures on local property values obtained from community input and field inspection.

The Project would be sited entirely on private lands that are currently in timber production. The value of these lands would be influenced by the reduction in timber production (downward pressure) and long-term lease revenues (upward pressure). It is likely that the net effect of these offsetting factors is positive.

For properties located in proximity to the proposed wind energy development, the two key issues are visual and noise impacts. Noise impacts have been cited as a concern with wind projects generally, but noise effects are generally limited to properties with turbines, whose property values typically increase as a result of long-term revenue streams from leases. In the context of visual impacts, assuming scenic values are incorporated or "internalized" into the existing value of properties in the Project area, there is the potential for downward pressure on property values if wind facilities are perceived to adversely affect the quality of viewshed, it being recognized that some find the view of wind turbines to be appealing There is likely greater internalization of scenic values on residential properties compared to undeveloped land in agricultural uses, such as grazing.

Conversely, they note, there are also sources of potential upward pressures on nearby property values emanating from wind energy developments. First, these projects offer both short- and long-term economic benefits in the region, including job and income creation, as well as future economic development opportunities associated with expanded infrastructure and a new power source. Second, wind developments may boost tourism to the area, thereby promoting regional economic development. Finally, the Project would provide long-term revenue streams as lease payments to property owners on whose land the Project facilities would be located. In summary, there appear to be conflicting pressures on property values from wind energy developments. The manner in which these pressures would interact for the Hatchet Ridge Project is unknown, and data are not sufficient to quantify the property value effects of the proposed Project

The ENTRIX team currently poses two key questions in their effort to better understand the effect of this wind energy project on Shasta County property values: (1) To what degree have scenic values been internalized in local residential property values? (2) How would the Project affect the scenic quality of the area?

10. Hoen, Ben, Ryan Wiser, et al., "The Impact of Wind Power Projects on Residential Property Values in the United States: A Multi-Site Hedonic Analysis," Lawrence Berkeley National Laboratory, Berkeley, CA, December 2009.

Following completion of his M.A. thesis in 2006, Ben Hoen joined Ryan Wiser at the Lawrence Berkeley National Laboratory to continue investigating the existence and composition of property value effects surrounding wind energy facilities in the United States. The authors have refined Hoen's 2006 hedonic regression model and extended their research to 10 communities surrounding 24 windfarm sites in nine states. The wind farms represented 13% of the existing wind generating capacity of the U.S. in 2005. They created ten hedonic models that measure the individual contribution of specific housing characteristics to property values. This is the most comprehensive and data-rich study of the effects of wind projects on residential property values done to date.

Their method utilized field visits to each of 7,459 homes experiencing a property transaction over the last 10 years, testing for the three effects of area stigma, scenic vista stigma, and nuisance stigma. They examined the effect of repeat home sales and looked for effects on home sales volumes. Homes ranged from 800 feet to over five miles from projects. They tested for the quality of the scenic vista and for the

degree to which wind turbines were visible. They even tested for the orientation of the house toward the wind project. Their extended research found no effect on transaction value for the three types of stigma defined in the study. Here are their conclusions:

> "Although each of the analysis techniques used in this report has strengths and weaknesses, the results are strongly consistent in that each model fails to uncover conclusive evidence of the presence of any of the three property value stigmas. Based on the data and analysis presented in this report, no evidence is found that home prices surrounding wind facilities are consistently, measurably, and significantly affected by either the view of wind facilities or the distance from the home to those facilities. Although the analysis cannot dismiss the possibility that individual or small numbers of homes have been or could be negatively impacted, if these impacts do exist, they are either too small and/or too infrequent to result in any widespread and consistent statistically observable impact. Moreover, to the degree that homes in the present sample are similar to homes in other areas where wind development is occurring, the results herein are expected to be transferable."

Literature on Economic Impacts of Wind Projects

While several of the above studies, such as Hatchet Ridge, include estimates of economic impacts, the following articles are reviewed for the information they offer about the economic impacts of wind projects and the wind power industry.

11. "Economic Impacts of Wind Energy Projects in Southeast Washington," Prepared for Southeast Washington Economic Development Association. Prepared by Economics Group of ENTRIX, Inc., 12009 N.E. 99th Street, Suite 1410, Vancouver, WA 98682-2497, March 6, 2009.

    This report by the Entrix team looked at three wind projects totaling 367 MW built in Columbia County near Dayton, Washington, with impacts examined in four counties in southeast Washington. They found that the projects generated a total of 189 jobs during construction, and 53 jobs during operations, including direct, indirect, and induced impacts. The report notes that rural Columbia County retained a small minority of the construction jobs with most going to the regional urban centers outside the county. Most operations employees do reside locally. The projects generated $4,837,000 in property taxes in 2008 for Columbia County taxing districts. Operations generated $3,081,000 in direct impacts, and $3,465,000 in total impacts annually.

    They found no data to support any impacts on property values, recreation, or community services coming from interviews with park, land, and infrastructure managers. Hunting continues in the area. Group tours of projects resulted in 600-800 visitors per year, with that number growing over time. The study concludes that while economic multipliers are low, the wind projects do confer benefits to the region and the degree to which benefits are captured locally depends on the proximity of the project to regional retail centers.

12. Grover, Stephen, "Economic Impacts of the Desert Claim Wind Project," Prepared for the enXco Company by ECONorthwest, 888 SW Fifty Avenue, Suite 1460, Portland, OR 97204, April 21, 2009.

This report analyzes a project in Kittitas County, Washington consisting of 95 turbines with a nameplate rating of 190 MW. The report confines itself to economic and fiscal impacts. The analysis relies heavily on secondary data, developing construction costs based on the DOE estimate of $1,920/kW cited in number 11 above, and run through the Jobs and Economic Development Impact (JEDI) cost model developed by the National Renewable Energy Laboratory (NREL). IMPLAN is then used to generate indirect and induced impacts. Construction of the project is estimated to create 282 jobs in total, with additional economic impact to the economy of $33 million. They estimate that 12 jobs will be created directly for operations, for a total of 36 jobs with indirect and induced impacts. Rental payments to private landowners for 40 MW are estimated to generate $600,000 per year in lease payments, and they estimate 76% of this will be spent locally using historical household spending patterns as the guide. Their estimate of $1,832,846 in annual fiscal impacts includes lease payments for turbines on state land and estimated impacts to state coffers.

13. Goldberg, Marshall, The Jobs and Economic Development Impact Model (JEDI), National Renewable Energy Laboratory (NREL), Golden, Colorado, http://www.nrel.gov/analysis/jedi

The JEDI model was developed in 2006 to calculate the economic impacts associated with wind power development. It relies on IMPLAN state coefficients to develop indirect and induced impacts. These coefficients are aggregated into 14 sectors of the economy. The direct impacts are inferred from a few simple parameters of the project, using default expenditure patterns taken from past wind power projects, and local purchase shares derived from past projects and reviewed by wind developers. The model is comprehensive in estimating financing costs and fiscal impacts as well. These default values can be overridden where better local information is available. As the model has been improved from a growing data base of actual wind projects, it is moving toward its objective of becoming a benchmark technique for easily estimating economic impacts.

14. Torgerson, Melissa, Bruce Sorte, and Tim Nam, "Umatilla County's Economic Structure and the Economic Impacts of Wind energy Development: an Input-Output Analysis," Special Report 1067, Oregon State University Extension Service, March 2006.

This study analyzed the economy of Umatilla County in northeastern Oregon. However, its real contribution was to compare several approaches to estimating the economic impacts of a hypothetical 50 MW wind project. They used the JEDI model calibrated to State of Oregon regional purchase coefficients (RPCs), the JEDI model calibrated to Umatilla County with IMPLAN RPCs, a version of IMPLAN with local RPCs edited to reflect local conditions, and an "optimized" IMPLAN model that looked to a future economy more poised to capture the spending of the wind industry. The last model was an attempt to address the weakness IMPLAN has with its fixed technology assumptions, and to demonstrate the benefits that could occur in a county trying to capitalize on wind investments. As expected, the JEDI model with state coefficients had higher impact estimates because more spending is captured in the state's economy than in the small rural region. The edited IMPLAN and the JEDI

model with local IMPLAN coefficients performed similarly. The authors encourage users to adapt either of these off-the-shelf models with as much local knowledge of the economy and of the project specifics as possible.

15. Ayee, Gloria, Marcy Lowe, and Gary Gereffi, *Manufacturing Climate solutions: Carbon-Reducing Technologies and U.S. Jobs*, Chapter 11: "Wind Power: Generating Electricity and Employment," Center on Globalization, Governance, and Competitiveness, Duke University, September 22, 2009, www.cggc.duke.edu/environment/climatesolutions

This study provides a good overview of the development of the wind power industry. It provides a detailed analysis of the supply chain for wind turbine manufacturing, the engineering and materials issues for improving wind technology, the firms involved in turbine manufacture, component manufacture, turbine transport, project development, and project operations and maintenance. Examples are given of older manufacturing firms adapting facilities to wind turbine component manufacturing. It notes that every 100 MW of installed wind power capacity provides 310 manufacturing sector jobs, 67 contracting and installation jobs, and 9.5 permanent jobs in O & M.

16. Wiser, Ryan, and Mark Bollinger, 2010 Wind Technologies Market Report, U.S. Department of Energy, May 2011.

This report is the latest in a series put out by the U.S. Department of Energy and staff from the national laboratories. It provides a concise summary of the status of the U.S. wind energy industry. Nevada wind installation to date was not listed. The study notes the increasing size of wind turbines with the average size installed in 2010 being 1.79 MW. The proportion of turbine components sourced domestically continues to grow and was an estimated 60% in 2009-10. The capacity-weighted price of wind power sales for projects built in 2010 was $73 per Mwh, though the market remains very fragmented, due to varying state renewable portfolio standards (RPS). This price is expected to fall in the near future due to lower turbine prices. The study also tracks individual wind project costs and reports industry averages. The average cost of projects installed in 2010 was $2,155/kW, and the average cost of proposed projects likely to be built in 2011 is expected to fall. Wind turbine prices have swung sharply from a sellers' market in 2008 to a buyers' market in 2010 due to an overcapacity of U.S. turbine nacelle assembly capability. Turbine prices have fallen 33% or more since late 2008, with an average decline of 20% for orders announced in 2010. O&M costs were observed to rise over time on a given project as components age and need replacement, and capacity-weighted costs of a sample of projects constructed since 2000 was $10/MWh. Wind integration costs into power systems are consistently below 10% and often below 5%. Federal financial incentives have created a favorable and certain policy environment and, combined with lower turbine costs, are expected to cause growth in project construction over the next two years.

Literature on Impacts of High Voltage Transmission Lines

The literature on property values and high voltage transmission lines (HVTL) is more extensive than that for wind energy projects. Two recent articles do a good job of summarizing the findings.

17. Elliott, Peter, and David Wadley, "The Impact of Transmission Lines on Property Values: Coming to Terms with Stigma," *Property Management* (2002) 20 (2): 137-152.

This article does a good job of providing a conceptual framework for analyzing the effects of power lines by focusing on the notion of stigma. They propose three interests at play for this negative externality: health concerns for humans, animals and plants from electromagnetic fields, visual impacts, and noise concerns. They classify the literature into three types of studies:

- Case studies based on regression models;
- Appraisal or valuation-based case studies that use relatively small samples of properties, and
- Case study attitudinal surveys of perceived effects on property values.

The authors review ten regression studies and find negative impacts of 1-9 percent varying with proximity to the power line. Valuation studies are fraught with problems relating to small sample size and the difficulty of matching pairs of property for comparison. Attitudinal studies are generally considered to over-estimate the negative impacts due to the lack of market data and problems with objective presentation of facts to respondents. The authors note that feelings of the stigma associated with power lines can be changed with education. They suggest that communities understand and express more precisely the nature of their dissatisfaction, so that design and engineering changes can address the issues cost-effectively.

18. Pitts, Jennifer M., and Thomas O. Jackson, "Power Lines and Property Values Revisited," The Appraisal Journal, Fall, 2007, pp. 323-325.

This short note provides a useful summary of the literature:

> "When negative impacts are evident, studies report an average discount between 1% and 10% of property value. This diminution in value is attributable to the visual unattractiveness of the lines, potential health hazards, disturbing sounds, and safety concerns. These impacts diminish as distance from the line increases and disappear at a distance of 200 feet from the lines. Where views of the lines and towers are completely unobstructed, negative impacts can extend up to a quarter mile. … Value diminution attributable to tower line proximity is temporary and usually decreases over time, disappearing entirely in 4 to 10 years."

They note that residential lots adjacent to power lines will sell more quickly, but that higher priced homes are more sensitive to proximity. Negative effects on sales time show up more in times of slow property markets. The authors conclude that buyers' personal preferences toward power lines vary and are important to determining whether power lines are a nuisance and negative force on property prices.